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# AN EVALUATION OF AIR OPERATIONS

AFFECTING THE U.S. MARINE  
CORPS IN WORLD WAR II

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IN REPLYING ADDRESS  
COMMANDANT OF THE MARINE CORPS  
WASHINGTON 25, D. C.  
AND REFER TO



SERIAL MC- 558459 HEADQUARTERS U. S. MARINE CORPS  
WASHINGTON

11 October 1945.

From: Commandant of the Marine Corps.  
To : Senior Member of the Board to Re-Examine Adequacy  
of Present Concept of Missions and Functions  
of the Marine Corps, Marine Barracks,  
Quantico, Virginia.

Subject: U. S. Strategic Bombing Survey - Japan.

References: (a) Ltr Senior Member U. S. Strategic  
Bombing Survey to CMC dated 28 Aug 45.  
(b) Memo of Rear Adm. R. A. Ofstie, USN.

Enclosures: (A) Copy of reference (a)  
(B) Copy of Memo of Rear Adm. R. A. Ofstie, USN.

1. Under a Presidential directive a survey and study is being conducted of the effect of the U. S. aerial effort in the war against Japan. Mr. D'Olier, President of the Prudential Insurance Company, is the chairman of the committee conducting the study and Rear Admiral R. A. Ofstie, U.S.N., is the senior naval member.

2. The Presidential directive has been interpreted to include a comprehensive evaluation of the entire air effort directed against Japan. It is expected that the results of this study will form a basis for major decisions in determining the composition of the future national security structure.

3. In order to assist in the evaluation of the air effort as it affected ground operations and the direct support of troops, the senior member of the U. S. Strategic Bombing Survey has requested the assistance of a ground officer or officers familiar with the direct support of ground operations by aircraft.

4. It is therefore directed that the board of which you are senior member prepare a paper evaluating air operations in the Pacific War as they affected the U. S. Marine Corps. In accordance with the request of the U. S. Strategic Bombing Survey it is desired that the technique and operation of close air support be accorded particular stress in the treatment.

*R. A. Vandegrift*

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MARINE CORPS SCHOOLS  
QUANTICO, VIRGINIA

MBT/ed1

31 December 1945.

From: Board to Reexamine Adequacy of Present  
Concept of Mission and Functions of The  
Marine Corps.

To: Commandant of the Marine Corps.

Subject: U.S. Strategic Bombing Survey - Japan.

Reference: (a) MC-558459, dated 11 October, 1945

Enclosure: (A) Study and evaluation of air opera-  
tions affecting the U.S. Marine  
Corps during the war with Japan.

1. In accordance with reference (a), there is submitted herewith a study and evaluation of air operations affecting the U.S. Marine Corps during the war with Japan in four (4) parts, as follows:

- I. The Mission of U.S. Marine Corps Aviation.
- II. Close Air Support - A U.S. Marine Corps Development.
- III. The Influence of Air Power on Major U.S. Marine Corps Operations During the War, With Particular Emphasis on the Close Support of Ground Forces.
- IV. A Brief Summary of Operations of U.S. Marine Corps Aircraft During the War, with statistical appendix.

*M. B. Twining*  
M. B. TWINING.





*U.S. Marine Corps.*

An Evaluation  
of  
AIR OPERATIONS

Affecting the U. S. Marine Corps in World War II.

JUN 23 1961

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# PART I

THE MISSION OF U.S. MARINE  
CORPS AVIATION



## PART I

### THE MISSION OF MARINE CORPS AVIATION

Marine Corps Aviation is an integral component of Naval Aviation, charged by the Chief of Naval Operations with the following missions:

1. THE SUPPORT OF THE FLEET MARINE FORCE IN  
AMPHIBIOUS LANDINGS. (e.g., Okinawa)
2. THE PROVISION OF REPLACEMENT SQUADRONS FOR  
NAVAL AIRCRAFT CARRIERS. (e.g., Honshu, Hokkaido,  
Kyushu)

The second mission, as assigned, necessitates the constitution and training of Marine Air Squadrons on a basis which will insure efficiency and continuity whenever they are employed as a part of the aircraft complement of aircraft carriers. Such continuity can only be assured if the Marine Squadrons are organized and trained exactly as are their naval counterparts.

In addition to preparation for the complex carrier operation task, Marine air units are required to be prepared to support the Fleet Marine Force in all the phases of the amphibious assault as well as in advance base defense. These requirements as stated actually charge the

Marine air arm with preparedness for participation in the entire spectrum of offensive and defensive amphibious warfare. It will be seen at once that these basic missions are widely variant in their character, and that effective execution of both demands an air component possessing a wealth of special qualification.

Marine Corps pilots are line officers or enlisted men who receive their initial training in the various Navy Flight Schools. When qualified, they hold the designation of Naval Aviator, as do similar personnel in the Navy. Enlisted personnel of the ground crews are trained (in their particular specialty) in the appropriate Naval Training Schools. During their training period, pilots, crew members and ground crews receive the same instruction as do all naval personnel similarly detailed.

Aircraft armament and equipment used by Marine Air Squadrons are supplied by the Navy Bureau of Aeronautics and are identical with such materiel furnished by the Bureau to Navy units.

Thus it is that upon organization a Marine Air Squadron is in all details similar to a Navy Squadron of the same type. Basic training, equipment, armament and aircraft are the same, and the two units are, at this point, in every respect interchangeable.

The primary mission of Marine Aviation - the support of the Fleet Marine Force in amphibious landings - requires an extensive supplementary period of specialist training for Marine Aviation organizations. This is accomplished by provision of further technical and tacti-



cal education or air officers and enlisted men, and by joint training periods exercising both air and ground elements of the Fleet Marine Force. Such training periods embrace not only conventional land operations, but also stress the technique of combined action in the amphibious assault. During this essential training phase, emphasis is placed on the development of air ground teamwork and coordination to bring about the closest form of tactical support from the air on behalf of the ground effort, particularly during the critical ship-to-shore phase of the landing attack. During this phase, full use is made of the opportunity to perfect the tactical relationship between the naval components and the Marine ground and air elements.

The largest tactical unit of Marine Aviation is the wing which forms an integral part of the Marine Amphibious Corps. It is capable of supporting either from the decks of carriers or from adjacent land bases, or bases seized during the early phases of the amphibious assault.

It will be seen then, at the outset, that the particular capabilities of Marine Corps Aviation distinguish that arm from similar elements of the Army Air Forces in its ability to operate from aircraft carriers, and from Navy Aviation in its special qualification for effective support of amphibious operations from either shore or carrier bases.



# **PART II**

**CLOSE AIR SUPPORT — A U.S.  
MARINE CORPS DEVELOPMENT**



## PART II

### CLOSE AIR SUPPORT - A U. S. MARINE CORPS' DEVELOPMENT

#### INTRODUCTION

The basic principles and functional technique of close air support, as employed during the war just ended, are a U. S. Marine Corps development. They represent a significant contribution to the act of offensive warfare and are a strong example of the objective teamwork which is so characteristic of the Marines.

In its accepted military sense, "close support" is a generic term implying immediate and specific assistance by one arm or weapon to another. The term carries with it certain definite and well recognized implications. These are (1) that the assistance is of a character lying peculiarly within the capabilities of the supporting arm and, conversely, pertains to a field of military action in which the supported arm is relatively ineffective or inferior, and (2) that momentarily, at least the supported arm is occupying the dominant role on the battlefield, the supporting arm playing a supplementary or contributory part.

No term in the military lexicon, however, is subject to greater misconstruction. For example: it is quite correct to speak of such services as supply, communications, ordnance, as supporting services because they are not direct instruments in the application of armed force. They manifest themselves only indirectly through the increased power

and efficiency which they give to the offensive weapons they serve. On the other hand, it is quite wrong, or at least a dangerous generalization, to classify definitely any weapon or combatant arm as occupying a supporting role in the absolute sense that its employment is always in the fulfillment of a subservient or subordinate mission.

Thus the cannon, for centuries relegated to a purely "supporting" role on land, reigned unchallenged at sea during those same centuries, as the dominant weapon of naval warfare. Moreover, even on land, World War II has seen instances of artillery employment not in support of foot troops at all but directed toward an independent tactical end entirely disassociated from infantry action - (e.g., New Georgia - Interdiction of Munda airstrip by heavy artillery in order to maintain air and naval supremacy in the Central Solomons). Tanks, aircraft, combatant vessels, artillery and infantry are merely the weapons placed by the nation in the hands of the field commander for the sole purpose of applying armed force in the interest of United States policy. They may be employed singly or in concert. On occasion each will momentarily play the dominant role; likewise on occasion each must devote its major efforts toward assisting one or more of the others. The over-all end is success in battle - the accomplishment of the military objective which gave birth to the array of force disposed for the purpose. This is only achieved by the highly integrated and coordinated concert of armed blows by a self-contained and complete war making machine completely responsive to the will of the nation as expressed



through and by the commander. Whether it be the case of a squad protecting the approach of a tank or a major fleet action covering an invasion, there can be no proper use of the term "support" in a sense of inferiority or subserviency. The arms, the weapons and the services are by themselves only parts. The machine itself is composed of all these parts, welded by an effective command system into a balanced instrument of warfare. Thus the arms and services employ their resources in battle, each in accordance with its specialized capabilities, not to enhance the military reputation of its commander nor its service prestige, nor for any reason whatsoever, but to make possible the attainment of ends sought by the United States.

This conception of the duty of the armed forces under the Constitution has always been clear to the Marine Corps - a fact due to the special position it has occupied throughout its existence. As a small force, it has seen some independent service. However it has usually been employed as part of much larger forces of the Army or Navy. In this capacity it often occupied a secondary, supporting or auxiliary role. Since historically most of its operations have been of a joint character, the Corps acquired early in its history an acute consciousness of the vital necessity for coordination in joint operations and an awareness of the danger born of ignorance or disregard for the capabilities of other services.

In one hundred seventy years of almost continuous participation in joint operations, usually in a subordinate role, the Marine Corps has never acquired the view that to support or assist another arm or

branch in performing a service to the nation was to suffer either indignity or loss of prestige. For this reason, it is hoped that the report which follows and the conclusions offered may be received with greater attention than the small size of the forces on whose combat experience they are based might seem to entitle them.

### Air Support in General

It is the Marine Corps' conception that support by aircraft embraces performance of any act lying within the capabilities of aircraft which is of direct assistance to the ground forces. In this general sense, it may find expression in any one of the following forms, most of which have been widely and successfully employed by the Marine Corps for a period of twenty-five years:

Attack of ground objectives - employing dive or glide bombing, incendiary agents, aircraft cannon and machine guns, rockets, smoke and chemicals.

Reconnaissance - visual, photographic and electronic.

Troop transport.

Cargo transport.

Parachute delivery of supplies.

Command and courier service.

Air spot and adjustment of fire.

Evacuation of casualties.

While all of the above are subject to differences of opinion in



the progress of developmental discussion, only the first falls within the field of general controversy. Further consideration will therefore be confined to that which is, without question, the most important form of supporting air action - the attack of enemy ground objectives.

The attack by aircraft of ground targets in a manner which will provide direct assistance to the progress of ground forces may take several forms:

- (a) Progressive destructive bombardment of specific objectives which are subsequently to be assaulted by ground forces, preliminary to initiation of such assault. The heavy pre-landing bombardment of Iwo Jima or the destructive saturation of Cassino fall in this category. Both were specific ground force objectives, but air attack launched against them could be executed without precise coordination between air and ground.
- (b) The attack of targets by aircraft immediately prior to assault by ground forces but on a time schedule basis. Such a time schedule precludes the necessity for maintenance of direct and continuous coordination between the air and ground arms. Pre jump-off strikes on targets which will be subsequent ground objectives fall in this group. Timing of the air attacks, arranged in conjunction with other preparatory measures is complete before the preparation is initiated and no further precise air-ground coordination is necessary. This

character of air attack presupposes targets which are not in such close proximity to front lines as to require direct communication between attacking aircraft and front line units.

- (c) The attack by aircraft of ground targets immediately confronting advancing ground forces in a manner wherein the air effort is tactically integrated with the ground effort and, as the operation progresses, is adjusted to achieve the maximum contribution consistent with the situation existing at the moment.

The first two forms of air support are common, having been practised throughout the war by all air arms. Their success is predicated mainly on intelligent target selection, adequacy of briefing, and proper arming and operation of the attacking aircraft. Their contribution is a corollary to the specific ground effort and not a part of it. The third form of air attack, by far the most complex, undertakes to integrate the great shock effect of the air arm with the precise destructive power of artillery and the fluid adaptability of the infantry and armor. It is to the accomplishment of this difficult task that Marine aviation set itself, both before and during the war just ended, and it was in this complex specialty that the Marine air component demonstrated its greatest effectiveness.

CONCISE STATEMENT OF  
THE MARINE CORPS DOCTRINE OF CLOSE AIR SUPPORT

1. GENERAL. This doctrine relates essentially to methods of providing close air support to amphibious ground forces engaged in the seizure and exploitation of a beach-head and subsequent operations involved in the establishment of a base.

2. DEFINITION OF CLOSE AIR SUPPORT. In its narrowest sense the term "close air support" is defined as: ATTACK BY AIRCRAFT OF HOSTILE GROUND TARGETS WHICH ARE AT SUCH CLOSE RANGE TO FRIENDLY FRONT LINES AS TO REQUIRE DETAILED INTEGRATION OF EACH AIR MISSION WITH THE FIRE AND MOVEMENT OF THE GROUND FORCES IN ORDER TO INSURE SAFETY, PREVENT INTERFERENCE WITH OTHER ELEMENTS OF THE COMBINED ARMS AND PERMIT PROMPT EXPLOITATION OF THE SHOCK, CASUALTY AND NEUTRALIZATION EFFECT OF THE AIR ATTACK. It does not include missions executed off the battlefield or at such range from the ground forces as to require no specific coordination of air and ground action beyond the general delineation of a zone in which air action is unrestricted.

3. REQUIREMENTS. For maximum effectiveness in providing close and continuous support for amphibious operations, the following are requisite with respect to

a. Aircraft.

- (1) Must be of a type capable of operating from carriers.
- (2) Must be of a type suitable for attack by dive bombing, glide bombing, rocket attacks, or by ground strafing at minimum altitude.
- (3) Must be fitted for selective arming with bombs, rockets, and automatic weapons.
- (4) Must mount communication equipment suitable for air-ground communication.

b. Organization.

- (1) Must be capable of conducting initial support operations from aircraft carriers.
- (2) Must be capable of shifting to land bases as the situation permits without interruption of support operations, and must be self sustaining when ashore.

c. Personnel.

- (1) Must have specialized training with respect to close support of ship-to-shore operations and subsequent operations ashore.

#### 4. EMPLOYMENT OF LAND BASED AIRCRAFT.

Land based aircraft of a type suitable for close support may be employed in support of the initial stages of the landing attack if land bases within effective supporting distance of the target area are available. Experience indicates, however, that this method has seldom been fully successful due to the distances involved and the attendant difficulty of securing an effective degree of coordination. In the latter stages of an operation such aircraft may operate more successfully from bases seized in the area of operations.

5. EMPLOYMENT OF NAVAL CARRIER BASED AIRCRAFT. In the initial stages of an amphibious operation, naval carrier based aircraft of a type suitable for close support may be employed with success if operating personnel are fully trained in the technique of supporting the ship-to-shore movement and ensuing ground operations. In the absence of such training, experience indicates that they should be employed on attack missions of a general character, not involving a high degree of coordination with the ground forces nor in close proximity thereto. Since the great preponderance of naval aviation elements do not possess such specialized training, the close support function falls naturally to Marine Corps aviation units.



6. COMMAND. In the initial stages of an amphibious operation, the Attack Force Commander will command all support aircraft. However, as soon as the Landing Force Commander has established his headquarters ashore, command of all support aircraft operating in support of his force will be released to him.

7. ASSIGNMENT OF SUPPORT AIRCRAFT. Since the basic function of support aircraft is the provision of close support for ground forces, such aircraft, when carrier based, will be assigned this duty as their primary task. Only under circumstances of such gravity as to constitute a major threat to the enterprise as a whole will direct support aircraft be diverted to reinforce ASP, CAP or fighter formations.

8. CONTROL.

a. General.

The effectiveness of close air support demands that the shock and destructive effect of the supporting aircraft be delivered against those targets which are immediately opposed to the front line troops. Control of such attacks must be effectuated by forces on the ground on a direct observation basis, and under circumstances wherein direct communication is maintained between the front line air liaison party and the supporting aircraft.

b. Control organization - ship-to-shore phase.

The elements of the ship-to-shore control organization are:

Air Support Control Unit (Seaborne), consisting of a control and communication organization embarked with the overall commander, equipped and authorized to act for that commander in all matters involving the control of support aircraft.

Landing Force Air Support Control Unit, an organization similar in concept and mission to the Air Support Control Unit (afloat). During the ship-to-shore phase, the Landing Force Air Support Control Unit maintains continuing liaison with the Air Support Control Unit (afloat) and is prepared, upon displacement ashore of the Landing Force Commander to accompany him, establish ashore, and when directed, to assume control of all direct support aircraft assigned.

Air Coordinators (Airborne), highly qualified aviation personnel employed in orienting attack air groups and assisting the Air Support Control Unit in the prompt execution of missions assigned.

Division Air Liaison Party, organized, trained and equipped to assist the Division Commander in exploiting the capabilities of aircraft assigned, and to advise the Division

Commander of the air situation during progress of the operation.

Regimental Air Liaison Party, organized, trained and equipped to execute the same function for the Regimental Commander as Division Party does for Division Commander.

Battalion Air Liaison Party, provides the same assistance for Battalion Commander as provided by Division and Regimental Parties in their respective echelons. In addition, this organization observes progress of direct support air operations within the battalion zone of action, transmits requests for direct support aircraft and controls strikes from front line localities.

c. Control Organization - Land Phase.

Upon displacement ashore of the Corps Commander and his staff, the Landing Force Air Support Control Unit is established ashore, initiates communications, and when directed assumes control of all support aircraft assigned. Other elements of the air support organization remain unchanged from the ship-to-shore phase.

9. COMMUNICATIONS.

Within the air support control system the following communication nets will be operated:



a. Support Air Direction Net, controlled by Commander Air Support Control Unit and monitored by Corps Division, Regimental and Battalion Air Liaison Parties. This net is operated for the purpose of directing aircraft in close support missions.

b. Support Air Request Net, employed by Air Support Control Unit and all air liaison parties. Its function is to provide a means for request, coordination, and adjustment of close support missions. One such net is normally assigned to each corps in a landing.

c. Support Air Observation Net, employed for communication with air observers. Normally one such net is assigned to each division.

d. Air Support Command Net, used for both operational and administrative traffic between air support control units, carrier task forces and shore based tactical air units.

e. Air Control Net, used for operational and administrative traffic between the senior air support control unit and the commanders of land-based air forces.

f. Inter-Commander Air Support Net, used for lateral communication between air support control units.

Further details on air support communications, with particular emphasis on types of equipment employed, will be found in "Appendix I, Section I".

## 10. TRAINING.

### a. Control personnel.

The senior member of each air liaison party will be a qualified pilot in active flight status. All air liaison parties will be given supplementary instruction in ground organization and tactics and in the tasks surrounding air-ground coordination. Subordinate members of air liaison parties and air support control organizations will be educated in the technique of their special tasks with particular emphasis on the peculiarities of air-ground communication.

### b. Flight personnel.

Flight personnel employed in close support operations will be provided special training in close support of ground troops to include ground organization and tactics, characteristics and capabilities of ground weapons, physiography and joint training operations with ground troops.

For further details on training of close air support personnel see "Appendix I, Section IV".

## 11. TECHNIQUE.

### a. Mission requests.

Air support missions will be requested by front line air liaison parties attached to battalions in contact with the enemy, employing the SAR net. Regimental and division

air liaison parties will signify approval of requests by silence, and will interject disapproval when considered advisable because of danger to adjacent units, interference with existing tactical plans, or necessity for conservation of resources. Upon approval by Commander Air Support Control Unit the mission is assigned to an appropriate flight group which is given initial briefing by the Air Coordinator.

b. Execution.

Briefing by the Air Coordinator is supplemented where necessary by additional instructions from the front line air liaison party in control of the strike. Targets are marked by smoke, and where advisable, front lines are identified by panels or smoke. Dummy runs, led normally by the Air Coordinator, are conducted and if considered satisfactory by the air liaison personnel observing, the strike is executed.

12. SAFETY.

Based upon strict adherence to the principle that strikes in immediate proximity to the front lines will be observed and controlled by the air liaison party attached to the unit involved, the assumption of risk devolves upon the commander of the front line unit immediately concerned. That commander will consider the hazard to his troops and the possible saving of

life which can result from successful conclusion of the strike, as opposed to the loss of life probably attendant upon advancing without air support. Regimental and division headquarters will normally not oppose execution of a mission because of its proximity to front lines of the unit requesting that mission. Such higher headquarters will, however, consider the effect of each requested mission upon adjacent units as well as upon the execution of the over-all fire support plan. Should the requested mission constitute an unjustified hazard to adjacent troops or require an unwarranted interruption in the existing fire plan, that headquarters will assume responsibility for cancellation of the mission.

### 13. COORDINATION WITH OTHER SUPPORTING ARMS.

Close air support is only one of a coordinate group of supporting arms, the full exploitation of which is essential in insuring the most economical capture of objectives opposing our forces. Aircraft will be employed only in execution of those missions which are beyond the effective capabilities of the other supporting arms except where the employment of aircraft is desired in the reinforcement of other means for neutralization and/or destruction. Coordination at all levels will be accomplished by the combined action of

air, artillery and naval gunfire liaison personnel in determining the most effective means of attacking each target and in advising the commander. At the division and higher levels this coordination will be conducted within the framework of the Target Information Center.





# PART III

THE INFLUENCE OF AIR POWER  
ON MAJOR U. S. MARINE CORPS  
OPERATIONS DURING THE WAR

with particular emphasis on the  
close support of ground forces



PART III  
THE INFLUENCE OF AIR POWER ON MAJOR U. S. MARINE  
CORPS OPERATIONS DURING THE WAR

INTRODUCTION

This section is concerned with the study of air power as it affected the major amphibious operations of the Marine Corps during the war, from the point of view of the ground arms. The many imponderables which surround the recorded description of a battle make a dogmatic assessment of the contribution of any arm or arms to the successful conclusion of the action subject to a wide latitude of error. With a clear realization of that fact in mind, there is set forth herein an objective description of the part which air power played in the major Marine Corps offensive efforts of the war.

Marines are front line troops. As such their operations are only indirectly affected by strategic air action. However, in those cases where a logical index is present, the effect of the strategic effort will be included in the general evaluation.

Through the succession of accounts there runs a series of facts which would seem to warrant certain conclusions of

fundamental significance in the evaluation of the overall air contribution. They are:

- (1) Attack from the air has small casualty effect on entrenched troops, but is effective in the destruction of materiel objectives, the interruption of communications, effective interdiction of daylight troop movement along roads, and the impairment of morale.
- (2) The delivery of close support, within the meaning of the Marine Corps definition, is an essential adjunct to the effective and economical conduct of offensive combat under circumstances similar to those encountered in the Pacific war.
- (3) An amphibious offensive even though covered by sea supremacy can be defeated or seriously jeopardized in its initial stages by an opponent who possesses a clear superiority in aircraft.

#### Early Experiences in the Use of Air Power.

In the first World War, Marine Corps aviation combat activities were confined to anti-submarine patrol operations based on the Azores, and to participation in the activities of the Northern Bombing Group based on the French channel coast. This group was engaged in strategic bombing but did participate in support operations to the extent of supplying

by air drop certain French units isolated during the German breakthrough in 1918.

Possibly with this experience in mind, Marine Corps Aviation was employed in Santo Domingo and Haiti in the years following the war in an effort to implement and facilitate the activities of the ground forces engaged in the pacification of those countries. Beginning with the year 1920 in these countries, dive bombing, ground strafing and supply drop were developed and regularly used in support of ground operations. Experimental operations included air-ground radio communications and the dropping of combat personnel by parachute. Panels were used for communication supplemented by air drop and pick up of messages.

The Nicaraguan occupation of 1927-1932 saw the same technique in use on a much larger scale, and the adoption of air transport as a regular means of moving combat formations of ground troops.

These embryonic beginnings formed a basis of confidence in, and respect for, the capabilities of aircraft in missions of cooperation which was further developed by the Fleet Marine Force in the United States during the years prior to Pearl Harbor. Fleet Marine Force training during this entire period was solely directed toward the perfection of all phases of the technique of landing operations, and the

Marine Aviation component was thoroughly schooled in its specialized tasks - neutralization of the enemy beach defenses during the period between the lifting of supporting naval gunfire and the landing of the first wave of troops, and the attack of those objectives which offered immediate obstruction to the advance of the attacking troops. During this period they developed a technique of attack which was to remain essentially valid and to become the basis of modern methods. It should be noted that this sustained and intensive training and development effort was conducted during a period of economy and cautious conservatism when other services ignored the problem entirely or paid it the merest lip service.



## DEVELOPMENT OF MARINE AVIATION

The Marine aviation organization which, in the period following the first World War, had pioneered the study of aircraft employment in support of ground forces, was pitifully small in size as we entered the period of pre-war expansion. In June of 1939 the entire establishment numbered only nine squadrons organized in two air groups. The personnel which made up this organization, however, were possessed of a wealth of experimental knowledge, and were prepared for the swift expansion to come.

Congress, in late 1940, authorized the construction of the "Two Ocean Navy" which included an air arm of 15,000 planes. Of this number, the Marine Corps was allocated 1,764, to be organized in two wings and totalling thirty-two (32) squadrons. It is most significant to observe that each of these wings was scheduled to be assigned directly to one of the two Marine Divisions, - proposed but not yet activated. Even at this comparatively early date, the singular importance of close support aviation was recognized, and the new air units were to be placed under the control of the units to be supported.

The expansion was hardly under way when a joint board of Navy and Marine Corps observers returned from a

survey of the European war. As a result of their recommendations the General Board of the Navy proposed, and Congress approved, a plan to roughly double the authorized strength of the Marine air component, adding an additional wing and four base defense air groups.

The outbreak of the war found the Marine Air Arm in the process of this rapid expansion. Seven of its squadrons were already overseas and the remainder were undergoing intensive training in the United States. The first anniversary of the Japanese attack saw twenty-two (22) Marine squadrons overseas, and eighteen (18) more under training on the mainland.

The Navy's 27,500 plane program of late 1942, as subsequently modified, provided for five Marine air wings of about 4,000 planes. This goal was met and surpassed, so that on 15 August, 1945, Marine Corps Aviation had grown from its humble nine squadron beginning to the stature of one hundred and forty-nine squadrons - eighty-nine of which were overseas.

It will be recalled, from Section I, that one of the assigned missions of Marine Corps aviation is the replacement of Naval squadrons on aircraft carriers. The end of the war found Marine fighter squadrons acting as replacement units on fleet carriers. Meanwhile the Marine carrier

program, as laid down in 1944, called for the Marine Corps to man sixteen (16) CVE's for purposes of providing close air support for ground forces. When the Japanese sued for peace, six (6) of the proposed sixteen (16) Marine carriers were manned and enroute to, or in, the combat zone.

# THE INFLUENCE OF AIR POWER ON THE GUADALCANAL

## OPERATION

### GENERAL

Guadalcanal, our first offensive ground blow in the Pacific had, as its immediate objective, the development of our air power. Sea and ground action were, in this case, to be the means of advancing our air potential to a point where interdiction of the enemy's sea lanes and neutralization of his air bases would halt the Japanese strategic advance to the southward, thus relieving the apprehension of enemy action in the New Caledonia-New Zealand-Eastern Australia triangle.

An operation in the Solomons had been envisaged as early as April 1942 by the Combined Chiefs of Staff, and the need for such an effort was accentuated during the ensuing two months as the enemy increased his strength in the GUADALCANAL-TULAGI area. Construction of a bomber field near Lunga Point on GUADALCANAL had been initiated and our air searches revealed a gradual expansion in Japanese naval activity in TULAGI Harbor.

Accordingly the Joint Chiefs of Staff issued a directive on 6 July to CINCPOA requiring capture of one or more localities in the southern SOLOMONS. This directive was implem-

# The Influence of Air Power on the GUADALCANAL Operation







ented on 16 July by COMSOPAC by an operation plan requiring seizure, occupation, and defense of the TULAGI-GUADALCANAL area and the SANTA CRUZ Islands.

The First Marine Division, possessed of the best knowledge and most effective techniques thus far devised in the subject of amphibious warfare was mounted for the enterprise in New Zealand, conducted rehearsals in the FIJIS and landed over the beaches east of Lunga Point on 7 August 1942 with concurrent landings on TULAGI and GAVUTU.

Preliminary air operations against the objective area began as early as 4 May, when carrier planes struck shipping in TULAGI Harbor, sinking a destroyer, two minesweepers and a cargo vessel. The next air attacks were not undertaken until about 1 August, when B-17s of the 11th Bombardment Group (U. S. Army Air Force) based on New Caledonia, commenced a series of six attacks on the airfield site on GUADALCANAL. The number of planes involved never exceeded ten and there is no evidence that the attacks caused extensive physical damage or seriously interrupted construction work, as the field, begun sometime after 4 July, was 80% completed by 8 August when it fell into our hands. Captured diaries, however, indicated that even these small scale sorties had an adverse effect on enemy morale -- the first indication of the war that the enemy was

very susceptible to the effects of high explosives in any form.

The carrier air component of Task Force 61 which supported the landing during the period 7-9 August provided general protection for the attack force during the approach and during the landing phase, as well as support for ground operations. They were instrumental in breaking up large scale attacks on the naval forces in Lunga Roads during the afternoon of 7 August and again on the following day.

The withdrawal of all naval forces on 9 August, following the disastrous surface encounter during the preceding night, left the landing forces ashore on GUADALCANAL and TULAGI entirely without protective or supporting aircraft until 20 August.

During this critical period the enemy enjoyed unchallenged supremacy at sea and in the air, and subjected our positions to constant attack from both elements. He also utilized this opportunity for building up his forces ashore by night landings to the east of Henderson Field, made under cover of surface bombardments. Had the enemy perceived or been able to take full advantage of this favorable opportunity by moving in force from RABAU and TRUK, it would have become difficult, if not impossible, to maintain our positions.

Henderson Field was operational on an emergency basis on 8 August, but no planes arrived until 20 August. This failure to commit land based aircraft to the operation at the earliest possible moment served to place in serious and needless jeopardy that which had been won at such great cost in naval strength.

The arrival of Marine aircraft on GUADALCANAL on 20 August, 1942, marked a turning point in the operation. It provided the most effective form of defensive striking power conceivable under the circumstances-- a means of attacking troop laden enemy transports approaching the area. In addition, it provided a reliable means of obtaining information concerning the approach of enemy forces -- a prerequisite to effective counter-offensive operations by the ground forces, since in the absence of such information troops could not safely be committed to any extensive field operations remote from the vital Henderson Field area.

The operations of these aircraft in clearing the skies and the surrounding sea areas of enemy forces were the most vital of all contributions to the successful defense of our first foothold in the Solomons. They caused the enemy his first great losses in aircraft, shipping and naval combatant vessels. They reduced the scope of hostile surface

activity to night landings and night bombardments, and as a result the large enemy land forces which were eventually built up ashore were never as fully effective as they might otherwise have been. On two occasions, 13 October and 15 November, they effectively shattered large scale attempts to land overpowering forces, and when in mid-November our surface forces regained naval supremacy in the southern SOLOMONS, it was evident that the defensive phase had passed to a successful conclusion.

During this period, the air forces participating in the defense, while predominantly made up of Marine Aviation units, also consisted of Navy and Army Air Force organizations based on GUADALCANAL. These forces at all times operated effectively and harmoniously under a single air command in spite of the adverse operating conditions which prevailed in the area throughout the entire period.

While it would be difficult to over-emphasize the part played by aircraft of all services based on GUADALCANAL, it is to be noted that they received some additional assistance from long range aircraft, Army and Navy, based on the islands to the eastward. It is possible, likewise, that the outcome of the SANTA CRUZ carrier engagement fought to the northeast of GUADALCANAL in mid-October, 1942, may have been of

considerable indirect benefit in making possible the improvement of the local situation. On the other hand, the small attacks by air forces based on New Guinea against RABAUL and BUIN appear to have had no appreciable effect on hostile operations in the SOLOMONS.

#### CLOSE AIR SUPPORT AT GUADALCANAL (Landing Phase)

There are likewise some lessons to be learned from air support activities in the early phases of the SOLOMONS Operations. Here the initial landing was made with air support furnished by carrier planes from Task Force 61 consisting of the SARATOGA, ENTERPRISE and WASP. These were Navy squadrons, veterans of Coral Sea and Midway, but not experienced in supporting ground operations. There was likewise no opportunity for conference prior to formulation of final operational plans for the landings on GUADALCANAL, TULAGI, and GAVUTU. Consequently the support planned was purposely framed on an elementary level, in keeping with the circumstances, and with every emphasis placed on certainty and simplicity.

The only attack involving detailed coordination was that delivered against the enemy center of resistance on the eastern end of TULAGI Island. This attack, prearranged to fit the selected scheme of maneuver, was based on the presumption that the enemy's main strength would be encountered here in



an area largely defiladed from naval gunfire due to sharp reverse slopes. The landing forces remained west of a pre-established line until the planes employed in the H-Hour strikes had re-armed and re-fueled on their parent carriers. This was necessitated by the limited number of planes available. The strike was to be delivered on call from the TULAGI Landing Force Commander, but not before H plus 1 hour and 30 minutes, to allow for the above rearming. The attack was to be launched on a pyrotechnic signal from the TULAGI Landing Force. Planes orbited on station at the appointed hour and the pyrotechnic execution signal was observed by the Air Group Commander. The attack was delivered as planned.

Air Support operations during the landing phase in the SOLOMONS were controlled and coordinated by means of an air control center established in the USS McCAWLEY, flagship of the Attack Force Commander. This control center maintained radio contact with aircraft on station as well as with the carrier task force. A fundamental weakness, and one which had been foreseen long before the operation was the fact that the Landing Force had no means of direct communication with aircraft on station. The seaborne Control Center acted as the clearing house for all air support operations, translating requests for air support from the landing forces into terms of



attack missions assigned the aircraft on station. The lack of flexibility in this scheme was manifest.

### CONCLUSIONS (Landing Phase)

The landing phase of the GUADALCANAL operation was not one which required detailed air support, nor could such support have been rendered effectively had it been required, due to the following factors:

- 1- Inexperience in this type of operation by air units assigned.
- 2- Lack of appropriate communication facilities and absence of air liaison parties and organized air support control units.
- 3- Lack of opportunity for prior joint planning, training, and rehearsal.

On the whole, and to the extent that it was required, however, air support in this operation was effective and in keeping with expectations. That this was so is directly attributable to the two officers who worked out the assault and defense air plans and established and operated the system of control.

Both of these staff officers were Marines, qualified by years of experience in naval aviation and possessed of a general knowledge of ground tactics and problems. Because of these qualifications they were able to improvise means of utilizing the striking power of naval aircraft in a primitive but effective

form of ground support.

Conclusions drawn from the landing phase of the SOLOMONS campaign were as follows:

1. Air support is an essential element in the successful assault of a defended beach regardless of the amount and quality of naval gunfire available.
2. A more positive means of control and communications is required.
3. It is desirable that direct radio contact be established between the supported and supporting unit and this presupposes the availability of highly portable air-ground communication means.
4. Air support will be neither responsive nor timely if requests must filter back through command channels. Superior control echelons must, however, be able to intervene promptly where necessary to conserve resources or to prevent action endangering other units.
5. To be fully effective, air support for landing operations should be carried out by air forces specially trained in this type of operation as a primary mission, and this training must include a thorough knowledge of the ground problem by supporting pilots.

## AIR SUPPORT IN THE DEFENSIVE PHASE, GUADALCANAL

Several days prior to the landing on GUADALCANAL, the general plan for organization of the defense was drafted by Commander Landing Forces. This specified that the defense of the island would be conducted primarily by the attack action of land based aircraft, and only secondarily by the action of ground forces. The major threat, formations of enemy troop transports, was to be opposed by the most suitable weapon at hand -- aircraft. This scheme of defense was put into effect upon the arrival of the first aircraft, and proved successful.

Land action was confined to operations against enemy forces which evaded our air forces and succeeded in establishing themselves on shore in force. This resulted in a prolonged period of sanguinary ground combat during which the situation was seldom considered so critical as to justify the diversion of any large number of planes away from the primary general defensive task to which they had been assigned. For this reason, the GUADALCANAL defense offers less opportunity for the study of close air support than might at first be supposed.

In the early weeks of the defense, the duty of providing close support for ground forces was assigned to a squadron of Army Air Force P-400 fighters, which had proved incapable of meeting the enemy Zero fighters or reaching his twin engine bombers, due to

limited ceiling and mediocre general performance. Their armament and characteristics were, however, suitable for low level attack on ground objectives, and they were so employed together with any dive bombers that could be made available.

On 8 September, they supported an attack by the First Raider Battalion on enemy positions at the village of Tasimboko, twenty miles east of Henderson Field. Communication difficulties reduced their effectiveness as all messages had to be relayed from the ground force commander to the Division Command Post to Henderson Field, thence back to the planes overhead.

Six days later, the same squadron assisted in completing the rout of the main Japanese force which had been repulsed in a large scale attempt to break through our positions immediately south of Henderson Field. Targets were indicated by ground force commanders on large scale aerial photographs which were marked and handed to the flight leader before take off. This was highly successful but only in view of the exceptional circumstance that the fight was in progress only a few hundred yards away from the airfield itself.

The ground force commander had repeatedly requested that air liaison parties, of the type which had been developed in peacetime by the Fleet Marine Force, be furnished to the forces on GUADALCANAL. As these were not forthcoming, such parties were improvised and trained on the island for future operations. This system proved a

partial solution to the problem of air-ground liaison for close support purposes, but two salient weaknesses remained. These were a serious lack of suitable air-ground communications means, and a technique of controlling support aircraft while in the execution of a support mission.

Thereafter, available aircraft were used to support repeated attacks made by our ground forces in the MATANIKAU RIVER region to the west of the Airfield. The dense jungle canopy made target designation and assessment of damages a difficult task, but on the whole the effectiveness of close air support was noticeably improved. This was attributable chiefly to increased experience and better communications. In general it can be stated that the GUADALCANAL defense did not provide either a true or extensive test of the effectiveness of close air support.

### GENERAL CONCLUSIONS

Air power rendered a powerful contribution in the conduct of the GUADALCANAL operation. Often, however, the value of the air effort was measurable more in the lessons to be gained therefrom than from the results. Among the general conclusions to be drawn from the GUADALCANAL operation, in addition to those noted in the Landing Phase, are the following:



1. The preliminary air attacks had little effect on the operation. In order to be effective, preliminary bombardment must be sustained, accurate, and must follow a logical plan.

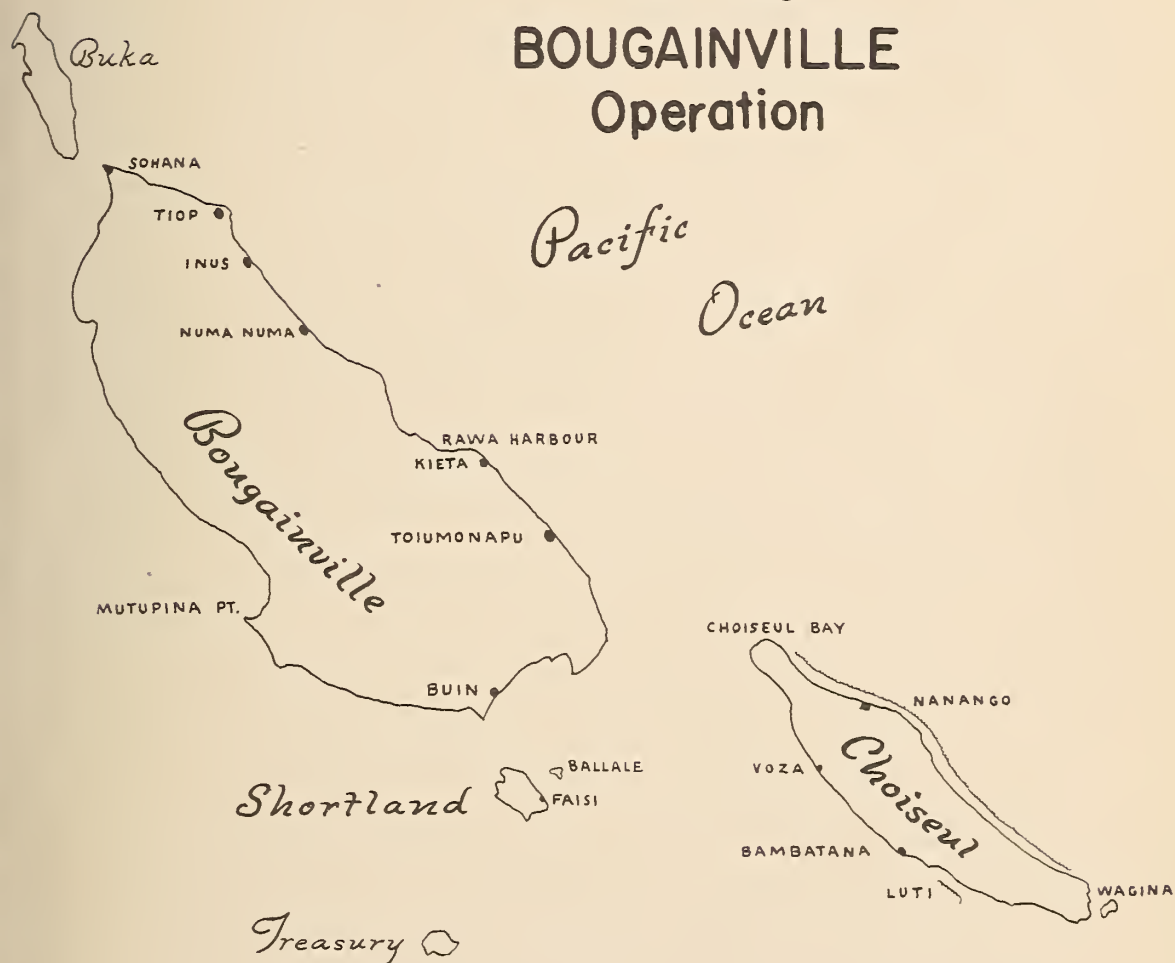
2. The P-400 type of Army pursuit airplane was a satisfactory close support aircraft, despite its great inferiority to the standard enemy fighter plane in other respects.

3. The Marine Corps and Navy carrier type aircraft were most satisfactory as close support weapons, as well as maintaining a comparable quality with enemy aircraft.

4. Even when provided with extensive air cover, transports with light anti-aircraft protection are vulnerable to air attack. This was manifestly demonstrated in the successful attacks by Marine planes on the major Japanese reinforcement operations of October and November 1942.



# The Influence of Air Power on the BOUGAINVILLE Operation





## THE INFLUENCE OF AIR POWER ON THE BOUGAINVILLE OPERATION

### GENERAL

Following the successful conclusion of the GUADALCANAL enterprise, our forces undertook a laborious advance up the SOLOMONS chain in the direction of the enemy's major operating area in the vicinity of RABOUL and KAVIENG. Operations were initiated for the capture of NEW GEORGIA and VELLA LAVELLA, and were successfully concluded in September, 1943.

The next major Marine Corps operation occurred in November when the First Marine Amphibious Corps, consisting of the Third Marine Division, the 37th Infantry Division, the First Raider Regiment, the First Parachute Regiment, along with subsidiary Corps troops, was committed to the task of capturing a small beachhead, measuring about six by eight miles at EMPRESS AUGUSTA BAY on BOUGAINVILLE ISLAND. The purpose of this operation, as at GUADALCANAL, was the advancement of the American air potential to a point where accompanying fighter aircraft could effectively support dive and torpedo bombers in a program of destructive attacks on installations and shipping in SIMPSON HARBOR (RABOUL). The outline of the plan was developed in late September, and the order for its execution was issued by ComSoPac on 12 October

Components of the task forces were given their preliminary and final training in GUADALCANAL, NEW CALEDONIA and at ESPIRITU SANTO in the NEW HEBRIDES. During this training period, the Third Marine Division made conscientious attempts to capitalize upon the experience gained in GUADALCANAL where the First Division had clearly concluded that the necessity for a close air support technique, as well as the personnel and equipment to implement this technique, were essential.

### PRELIMINARY OPERATIONS

#### AIR

The enemy held the BUIN-SHORTLAND-BALALLE-CHOISEUL BAY area in strength. Between this powerful installation and the important air and supply base on BUKA, off the northern tip of BOUGAINVILLE, the coastline was lightly held and afforded many excellent opportunities for a beachhead operation consistent with the mission.

Two serious apprehensions, however, developed in examination of any plan devised for the seizure of such a beachhead. They were:

1. The close proximity of powerful enemy air bases at RABAU, BUKA and BUIN-SHORTLAND.
2. The ready ability of the enemy to shuttle reserves by road or by barge from his strong bases nearby to any selected landing area on BOUGAINVILLE ISLAND.

These two very real threats were countered by neutralization efforts in the air and on the ground.

Commencing on 1 October 1943, ComSoPac directed the Commander Aircraft North Solomons to initiate neutralization activities against enemy installations in the target area to the full extent of his capabilities. During the ensuing month, aircraft under his command undertook the neutralization of the five major airfields in the BOUGAINVILLE area, attacking anti-aircraft positions, cratering runways and striking supply dumps. The five large fields in the vicinity of RABAUL lay at the extreme range of our land based planes, and attacks on these areas though most hazardous, were to be undertaken whenever possible and were supplemented with occasional B-25 attacks by planes of the 5th Air Force.

Concurrent with the neutralization effort, a Marine photographic squadron, VMD -754, the only unit of its type extant in the Solomons at this time, commenced an intensive program of photographic coverage of the enemy installations in the target area. The photographic effort continued throughout the progress of the campaign, providing effective photo coverage during the operation.

Prior to the arrival of the assault task force off the EMPRESS AUGUSTA BAY beaches, the neutralization effort had achieved certain unquestioned success. The airfields in the BUIN-SHORTLAND-BALALLE area were inoperative. The great majority of enemy aircraft assembled on those fields were either destroyed or damaged

beyond the repair capabilities of the ground forces in the area. The airfields at BUKA were damaged but operative. Interdiction was of such dimensions as to weaken the repair and rehabilitation capabilities of those fields, but of insufficient strength to prevent offensive operations therefrom or to prevent the arrival and assimilation of replacement aircraft. The five fields in the vicinity of RABAUL, however, remained operational. Daylight barge traffic, south of BUKA, was reduced to an ineffective level. Night barge traffic, of course, continued unimpeded.

During the period, air engagements, brought on by the challenge of our repeated sorties into the enemy area of strength, achieved the destruction of 394 aircraft which might otherwise have exerted a considerable effect during the ship-to-shore phase of the operation.

### PRELIMINARY GROUND OPERATIONS

In order to provide effective air support control and air warning for the EMPRESS AUGUSTA landing, the Eighth New Zealand Brigade was landed on TREASURY ISLAND (south of Bougainville) on D-5 day (26 October 1943). As a diversion, in an effort to cause the movement of the enemy's reserve forces in the SHORTLAND area away from the zone of our actual attack, the 2d Marine Parachute Battalion was landed (in landing craft) at VOZA on CHOISEUL ISLAND on D-3 (27 October 1943).



## FIGHTER PROTECTION

The neutralization of the Japanese airfields in the BOUGAINVILLE area reduced the threat of enemy aerial opposition from that quarter but as has been noted, the enemy still had five airfields in operation in the RABAU area, a scant 200 miles from our TOROKINA beachhead. The air command, Commander Aircraft, North Solomons, which was a forward echelon of the First Marine Aircraft Wing, went ashore on D-Day with its primary function - "the active air defense of the BOUGAINVILLE REGION".

As the BOUGAINVILLE landing force moved towards its objective on the night of 31 October, it was covered by both Marine Corps and Navy night fighters. One hour before dawn, fighters (Marine, Navy, Army and New Zealand) began reporting on station to protect the task force. One hour after the first troops reached the beach, the first enemy air attack was launched but the attack was broken up by the fighter cover. The fighters providing this cover were based at VELLA LAVELLA, ONDONGA (NEW GEORGIA) and MUNDA until the TOROKINA fighter strip was operational. The size of the fighter cover varied from 24 planes on station during normal days to as many as 60 or more on days when convoys were unloading supplies. The aircraft for this cover were about 50% from Marine squadrons. During the first six weeks of the operation, the aggressive nature of the enemy air effort was of such dimensions as

to render the protection of the beachhead by friendly fighters an essential.

Fighter direction on D-Day was handled from a destroyer. On the morning of D plus 1 day, fighter direction shifted ashore, and was effectively conducted by a Fighter Director organization under control of the First Marine Aircraft Wing for the balance of the operation.

### CLOSE AIR SUPPORT

The great importance of close air support was recognized by the Marine command prior to the operation and, within the limits of personnel and equipment available, a determined effort was made to develop an effective air support control technique. In August 1943, three officers and six enlisted men of the First Marine Aircraft Wing were attached to the Third Marine Division for air liaison duty. The officers were qualified naval aviators, familiar with the technical problems of light bomber aviation, while the enlisted men were especially trained in the use of portable radio equipment and in aviation communication procedure. A close air support school was organized under the direction of the Division Air Officer and was attended by officers from each infantry regiment and battalion headquarters.

Based on GUADALCANAL experience, three main objectives were sought in air support studies conducted by the Third Division. These were: improved means of target designation, exploration of

the precise effect of bombs and fusings of various types, and the determination of safety margins necessary for protection of our own troops. The employment of varied colored smoke for target designation was studied as a means of decreasing the effectiveness of the enemy's previous attempts to confuse our target designation with white smoke. During the instruction, air liaison party personnel were given intensive training in the use of field communication equipment and in air-ground communication procedure. Thus, when the Third Marine Division went ashore at BOUGAINVILLE, its subordinate units included trained air liaison parties which could advise the ground commander in matters of air support, could transmit requests for such support and could assume tactical direction of any aircraft assigned.

The airborne component of the close support framework began its preparations when the headquarters of Commander Aircraft, North Solomons was formed and began functioning as a part of the 1st Marine Amphibious Corps. ComAirNorSols was charged with, (1) the active air defense of the BOUGAINVILLE region, (2) the establishment of an Air Warning Service for the TOROKINA-TREASURY AREAS and (3) the establishment of air support control for the TREASURY and TOROKINA AREAS. To carry out this function, ComAirNorSols was given operational control of all aircraft (except carrier based) in the BOUGAINVILLE area. Until the airfields at TOROKINA were open, this control was exercised by radio over the aircraft assigned to ComAirSols at MUNDA.

The landing force at EMPRESS AUGUST BAY made use of close support aircraft from the beginning. As the first assault wave was entering the landing craft, Marine torpedo bombers based at MUNDA arrived over the task force. When the landing craft left the shelter of the transports and headed for the beach, torpedo bombers started their bombing runs. Four planes loaded with one-ton bombs attacked assigned targets on Torokina Point, while others dropped strings of 100 pounders in the jungle just beyond the landing beaches. The planes returned to strafe after the bombing runs were completed. The bombers carried out their assignment efficiently but the report of the First Marine Amphibious Corps declared that "While the bombing and strafing of the beaches was considered excellent, it was not considered to be in sufficient strength." Further reports emphasized the effectiveness of the larger bombs, while doubt was cast on the destructive capabilities of smaller types.

No call was made for close support by bomber aircraft until 9 November. Then, the 3d Marine Division called for 18 TBFs to be on station over PIVA village at 0915 the following day to bomb Japanese positions and soften them up for an infantry attack which was scheduled for 1015. Four additional planes were requested to be on station at 1015 to answer calls for support during the infantry attack. Twelve TBFs reported on station at the scheduled time and radio contact was established with the air liaison party on the ground. Friendly lines were marked with smoke and the planes were instructed



to bomb from the smoke markers to PIVA village. Bombs were promptly dropped to within 120 yards of friendly troops and the target area was well covered. The flight of SBDs which arrived on station at 1015 was not needed, since the infantry attack was successful. The enemy abandoned their positions, leaving behind much equipment.

On 14 November, close air support was again effectively employed by the 3d Marine Division against a strong enemy position 2500 yards north of PIVA village. Eighteen TBFs loaded with 100 pound bombs were assigned to the mission. The target, which was 100 yards from friendly positions, was bombed and strafed. When the infantry launched its attack, it found the area to have been abandoned. The planes were credited with 95% hits in the designated target area.

No further use of direct support was made until the ground troops met heavy opposition on "Hellzapoppin Ridge". On 13 December, the 3d Marine Division requested air support for the following day. Three SBDs and three TBFs which happened to be at TOROKINA Strip (they were still MUNDA-based), were assigned to bomb the target that afternoon.

The following morning, 16 TBFs bombed the 50 yard target with 90% hits but this, plus the infantry attack which followed, failed to dislodge the Japanese on the ridge. On 15 December, the same

target was accurately bombed again by 18 TBFs, but the infantry was still unable to advance. In the belief that the bombs, which were fuzed to explode 1/10 of a second after impact, were not penetrating to the well dug in enemy, a strike was requested for 18 December using 4-5 second delay fuses. Six TBFs attacked at 1200 that day, scoring 100% hits in the target area only 75 yards from the friendly positions. The planes landed at TOROKINA and five made a return visit to another part of the ridge at 1600. They strafed after dropping their bombs and then made dummy runs to cover the successful advance of friendly troops. The action report of the 21st Marines declared that the final air attack on "Hellzapoppin Ridge" broke the enemy resistance.

The last call for close air support made by the 3d Marine Division in the BOUGAINVILLE operation was for a series of missions on 25 and 26 December against enemy positions on and near Hill 600A. The targets varied from slit trenches to splinter proof emplacements and were marked for the planes with white mortar smoke. The TBFs made two attacks on 25 December and one on 26 December. After the third attack, our patrols found the target area, which showed evidence of having been occupied by 800 Japanese, completely abandoned.

The missions carried out in support of 3d Marine Division troops during the BOUGAINVILLE campaign were well worthy of the designation "close support". On all missions, the target area was within 500 yards of friendly positions and on two occasions only 75



yards separated the target from our own lines. Communications between aircraft and ground forces however, were never highly satisfactory, indicating a further need for development of communications technique. Furthermore, it is certain that with improved communications means and increased confidence gained from success of the principle, many more occasions might have been taken to employ close support aircraft.

In addition to the close support missions performed by Aviation, SBDs and TBFs were used to supplement the information provided by aerial photography. Frequent missions were flown to the front lines to observe for the ground command. Closely allied and sometimes combined with these liaison flights were artillery interdiction missions and artillery spotter flights. Approximately 750 such sorties were flown by planes based at MUNDA between 27 October and 11 December (when 6 SBDs were based at TOROKINA to take over the task).

As a counter-measure to Japanese mortars and artillery, which at first inflicted damage upon unloading ships, SBDs loaded with bombs were kept on station during the daylight hours when a convoy was unloading. Although these planes rarely dropped bombs on enemy artillery positions, their presence had a strong effect in keeping enemy heavy weapons silent.

## SUPPLY AND EVACUATION BY AIRCRAFT

Aircraft made a significant contribution to the progress of the BOUGAINVILLE operation in the conduct of large scale supply and evacuation activities. These efforts fell into two groups -- the delivery of supplies by parachute drop and the execution of evacuation missions by both seaplane and land plane.

The South Pacific Combat Air Transport, equipped with R4D (C47) type aircraft, manned by Navy, Marine and Army personnel, conducted the BOUGAINVILLE air logistical operations. Marine aircraft were assembled administratively under Marine Air Group 25 while Army aircraft were administratively responsible to the Commanding General, Thirteenth Air Force. Naval personnel involved were under the administrative control of Commander Fleet Aircraft South Pacific. This heterogeneous organization, embracing elements of all three branches, functioned efficiently and contributed materially to the success of the BOUGAINVILLE enterprise. The over-all commander of the system was a Marine officer.

Initial logistical efforts by the South Pacific Combat Air Transport in the BOUGAINVILLE operation took place during the period 28 October - 3 November, in support of the parachute battalion on CHOISEUL ISLAND. During this period, transport aircraft based on GUADALCANAL, and flying under fighter cover provided from

MUNDA and VELLA LAVELLA, supplied rations and ammunition to the diversionary group. These para-drops were executed at a longer range than any previous thereto in the Pacific war. The packing and launching operations were conducted by Marine Corps parachute air delivery personnel and during the progress of the operation, over 80% of the volume dropped was successfully recovered. Subsequent supply drops were made to ground troops in advance positions in the EMPRESS AUGUSTA beachhead prior to the opening of the first landing strip within the beachhead at TOROKINA.

Evacuation of the seriously wounded to hospitals at MUNDA, VELLA LAVELLA and GUADALCANAL was effected initially by the employment of PBY (Catalina) patrol aircraft. These planes, flying under fighter cover, performed admirably in the execution of high priority evacuation missions. Upon the establishment of the TOROKINA air strip, all air evacuation was undertaken by R4D planes of the South Pacific Combat Air Transport. During the whole of the BOUGAINVILLE operation, this organization evacuated a total of 1217 casualties and delivered 840 tons of high priority supplies to the EMPRESS AUGUSTA area.

### CONCLUSIONS

The BOUGAINVILLE operation, by far the largest undertaken until that time, marked a long stride in the evolution of the part aircraft was to play in the support of the amphibious advance. Conclusions developing therefrom were:

1. Efforts at airfield neutralization, wherever the targets were well within the range capabilities of aircraft at hand, were effective and constituted an important contribution to the success of the operation.
2. Attempts at airfield neutralization in localities at or near the extreme range of planes available was ineffective since the enemy was completely free to effect replenishment of aircraft and supply from localities outside the arc of our activity.
3. The efforts at destruction of enemy supply installations even when well within the range of our aircraft were relatively ineffective.
4. Weight for weight, large sized high capacity bombs are more effective in the attack of protected installations than an equal weight of smaller bombs.
5. The approach of the assault task force and the activities on D-Day could have been seriously affected by enemy air intervention had not the task force been provided with adequate fighter cover.
6. The necessity for fighter cover to protect unloading operations in the landing area was necessary for the first forty days of the operation. Without adequate fighter cover this logistical effort, and in consequence the tactical effort, would have been seriously compromised.

7. The potentialities of close support aircraft were further developed but the technique of close air support control was still in a rudimentary stage. Principal shortcomings were lack of effective portable communication means and lack of a centralized control agency for support aircraft. The few efforts at close air support which were undertaken demonstrated clearly, however, the vital part which such operations can play in the advancement of the over-all strategy.
8. Until airfields are seized within the beachhead area, it is of prime importance that close support aircraft be based within short range of the scene of operation. If land bases are excessively distant, support must be executed from aircraft carriers.
9. Pinpoint interdiction missions aimed at silencing enemy artillery was an effective measure against Japanese artillery. The employment of aircraft in adjustment of artillery and naval gunfire was effective.
10. The delivery of supplies by airplane drop and the evacuation of casualties by aircraft demonstrated their worth in the over-all offensive structure.



THE INFLUENCE OF AIR POWER  
ON THE GILBERT ISLANDS OPERATIONS

STRATEGIC FEATURES OF THE OPERATION

In the summer of 1943 the overall strategy dictated an offensive effort in the Central Pacific to go forward in concert with the northward advance through the SOLOMONS and the progressive operations in NEW GUINEA. Accordingly directives were issued and plans formulated for the seizure of NAURU, BETIO ISLAND of the TARAWA Atoll and APAMAMA Island. Subsequently NAURU was discarded as one of the objectives and MAKIN Island substituted therefor.

Strategic objectives of the operation were to:

- (a) Gain control of the Gilbert Islands.
- (b) Prepare to gain control of the Marshalls.
- (c) Improve the security of lines of communication.
- (d) Inflict losses on the enemy.
- (e) Support the operations in South-Southwest Pacific and Burma areas by extending pressure on the Japanese.

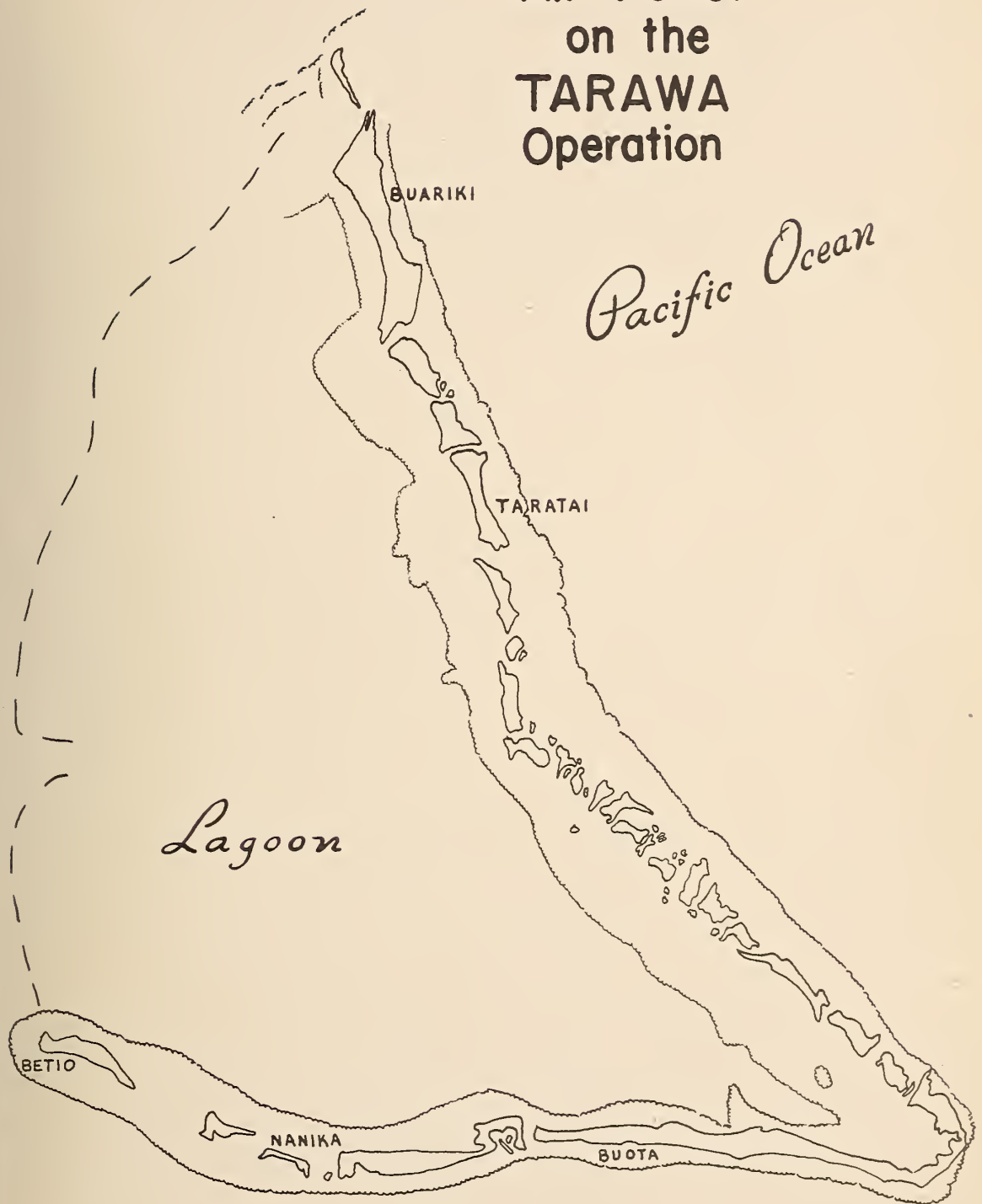
The Fifth Fleet was to prevent enemy interference by destroying or repelling enemy forces, and by attacks on enemy airfields in the Gilberts and Marshalls.

Shore-based air was to support the Central Pacific campaign by all possible air operations including the following:

- (a) Photographic reconnaissance of objectives and their supporting bases.



# The Influence of Air Power on the TARAWA Operation





- (b) Long range searches in the objective areas and in the sea approaches thereto.
- (c) Night strikes against objectives and their supporting bases.

Carrier-based aircraft were to execute the following missions in support of the operations:

- (a) Establishment and maintenance of aerial superiority.
- (b) Assistance in the destruction or neutralization of enemy defenses on the objectives.
- (c) Provision of close support for the assault.
- (d) Medium range searches forward of each task unit.
- (e) Fighter protection of each task unit, and of objectives after landing of friendly troops.
- (f) Anti-submarine searches adjacent to each task unit.
- (g) Gunfire spotting for fires on objectives.
- (h) Continuous observation and report of situation at the objectives.

The total aircraft available for this operation by types were:

	VB(H)	VB(M)	VSB	VTB	VF
Land-based	21	82	-	-	131
Carrier-based	-	-	203	191	366
TOTAL	21	82	203	191	497

The Commander Southern Carrier Group had available two large carriers, one medium carrier and five escort carriers for support missions at TARAWA.

Preliminary air bombardments started for the GILBERT Operations on 5 November 1943, by carrier-based air which damaged cruisers and destroyers in RABAUH Harbor. This strike had the expected results of partially immobilizing the main elements of the Japanese Fleet, because of lack of light forces, thereby preventing any interference with the operation by enemy surface forces.

MILLE was bombed on November 14, 15, 17 and 18; JALUIT November 15 and 16; MALOELAP November 16 and 17, and NAURU on November 18. TARAWA was bombed on November 14, 17, and 18. On November 19, MAKIN was bombed by both carrier-based aviation and shore-based planes.

Air strikes prior to D Day gained; and the covering carrier force maintained complete aerial supremacy during the assault. Enemy air activity was limited to an occasional snooper, and in the later stages, unsuccessful night attacks.

### TACTICAL FEATURES OF THE OPERATION

The tactical plan adopted for execution of the GILBERT Islands Operation involved three ground task units:

- (1) The Southern Landing Force consisting of the 2d Marine Division, less 6th Marine Regiment (Reinforced) was directed to land, seize, and occupy BETIO Island; then conduct further operations to reduce the remainder of TARAWA Atoll, under support air and naval gunfire.

- (2) The Northern Landing Force consisting of the 165th Infantry Regiment (Army) (Reinforced), was directed to land, seize, and occupy BUTARITARI Island; then conduct further operations to reduce the remainder of MAKIN Atoll, under supporting air and naval gunfire.
- (3) Corps Reserve, the 6th Marine Regiment (Reinforced), was directed to be prepared to land, on order, on beaches to be designated on either TARAWA or MAKIN Atolls.
- (4) The Reconnaissance Company, Fifthphibcorps, (less one platoon), was directed to land from submarine on APA-MAMA, which reports had shown to be unoccupied.
- (5) An alternate plan called for the 2d Marine Division (less 6th Marines Reinforced) to land on two islands of the APA-MAMA Atoll and on order to seize and occupy these islands; then to conduct further operations to reduce the remainder of APAMAMA Atoll. The Corps Reserve, (6th Marines Reinforced) was to be prepared to pass to control of the 2d Marine Division, on order, for the execution of the above mission.

### EXECUTION

Execution of the ground plan took the following form:

The 2d Marine Division landed on BETIO on D Day (20 November 1943), and the 165th Infantry on MAKIN. The Fifth Amphibious Corps Reconnaissance Company landed on APAMAMA on 21 November 1943, at

1900. At 1420 on 20 November 1943, Corps Reserve was released to the Commanding General, 2d Marine Division to assist in capturing TARAWA Atoll.

Organized resistance on MAKIN Atoll ended on D plus 2 day. The few Japanese (about 26 in number) on APAMAMA were cornered by the Reconnaissance Company, and by D plus 5 were either killed or committed suicide. Organized resistance on TARAWA Atoll ended about D plus 3 day after sixty hours of fighting which was not exceeded in bitterness throughout the war.

The air schedule for D Day was executed according to plan, the attacks being effectively coordinated with gunfire, and furnishing material assistance to the landing troops. Adequate support aircraft were available on station throughout that day and thereafter during the assault.

Combat Air Patrols were maintained throughout the operation. Control was exercised from a fighter director destroyer, as in the initial stages of the BOUGAINVILLE operation.

Upon being relieved, Combat Air Patrol flights were required to report to the Support Aircraft Commander for execution of close support missions, prior to returning to base. However, this plan did not achieve the desired results occasionally when returning combat Air Patrol flights failed to report to the Support Aircraft Commander upon relief, thereby unnecessarily reducing the number of aircraft available for close support missions.

#### CLOSE AIR SUPPORT

Each Landing Force unit, down to and including the battalion was provided an air liaison team, composed of Marine and Navy personnel at TARAWA, and Army personnel on MAKIN, for the purpose of assisting



the unit commander, in the selection of suitable air targets, and conveying the target designations to the Support Aircraft Commander at each objective.

The Assault Force flagship at each objective was equipped to monitor communications in all phases of the supporting air activity. Over this communications system the Force Commander was able to control the air operations, through his Support Aircraft Commander. A mobile shore-based air net duplicating the one on each flagship was provided the Landing Force Commander for employment ashore, at such time as command of support aircraft might be relinquished by the Assault Force Commander.

Extensive use was made of liaison planes, each piloted by a senior aviator who was conversant with the ground plan and in radio contact with the Support Aircraft Commander. These planes maintained constant surveillance of the objective and assisted in the execution of close support missions. This scheme, the forerunner of the present Air Coordinator, proved most satisfactory.

On D Day supporting carrier aircraft executed a dawn strike on BETIO with the primary mission of destroying coastal defense batteries and a secondary mission involving destruction of A/A batteries; construction, and personnel. Torpedo bombers attacked coastal defense batteries, barracks areas and other construction while scout bombers armed with 100 pound bombs attacked A/A guns and major gun emplacements, and

fighter planes strafed exposed personnel. Five minutes before H hour fighters strafed the beaches, as the landing craft approached them; while torpedo and scout bombers armed with 500 and 100 pound bombs attacked the secondary defenses behind and on each side of the landing beaches. This constituted the entire pre H hour air effort. It will be seen that, by current standards, this preparation was extremely light, and the bitter resistance subsequently offered the assault troops demonstrated this preparation, along with the horizontal bombing efforts of 14, 17, and 18 November, to have been quite insufficient. It was clearly indicated that a more painstaking destructive effort, employing heavy bombs and precision methods, is required if the enemy's power to resist at the beach line is to be greatly reduced.

Due to the small size of BETIO Island and the confusion of the close quarters combat, it was difficult for the forces on the ground to determine the exact locations of our own front lines, thus rendering close support air operations most complicated. However, once air liaison teams were oriented on the ground and had established communications with carrier-based planes, they achieved excellent results. On frequent occasions close support missions calling for strafing within 100 yards of our own front lines were accomplished with paralyzing effect on the enemy.

During the short but intense fighting at TARAUA, carrier-based planes are known to have flown a total of 440 sorties, with 413 of these planes actually attacking their objectives and dropping a total of 143 tons

of bombs. The above reports do not include sorties flown by planes of the carriers LISCOME BAY, CORREGIDOR, and CHENANGO; from which no reports were received.

### CONCLUSIONS

Immediately upon completion of the conquest of the GILBERT Islands, the construction of airfields was initiated. From these fields land-based planes could operate against other Japanese holdings in the Central Pacific and undertake a methodical destruction of all supply and communication installations within range.

Among the valuable lessons learned on this operation concerning the function of air power were the following:

(1) A more intensive preliminary bombardment than that employed at TARAWA must be delivered on the objective before attempting to land troops, and the bombardment effort must be carefully planned and coordinated, employing pin point bombing techniques.

(2) Repeated photographic coverage must be made of the objective in order to insure accurate and dependable information as to the extent, strength, location, and character of the defenses to be encountered.

(3) The system of close air support control employed in the GILBERTS operations was satisfactory and warranted general adoption. It was further demonstrated to be essential that air liaison parties and air support control organizations should be trained immediately for future operations, and that methods of training and equipment of these parties should be standardized along the lines employed by the Marine Corps.

(4) It was clearly evident that carrier air groups must have adequate opportunity to maneuver with the ground forces under air liaison party control, and that the pilots must all be thoroughly schooled in the technique of close air support.

# The Influence of Air Power on the MARSHALLS Operation



*Eniwetok Atoll*

ENIWETOK



*Bikini Atoll*

*Rongelap Atoll*



*Wotho Atoll*



*Ujae Atoll*



*Ujae Atoll*



*Kwajalein Atoll*

*Pacific  
Ocean*





THE INFLUENCE OF AIR POWER  
ON THE MARSHALL ISLANDS OPERATION  
STRATEGIC FEATURES OF THE OPERATION .

In the fall of 1943 the Fifth Amphibious Force, including the Fifth Marine Amphibious Corps, was alerted for operations against the MARSHALL Islands as an element of the over-all Central Pacific strategy. Plans were formulated, embracing lessons learned from the preceding GILBERTS Operation. The principle strategic features of the MARSHALLS plan were as follows:

- (a) An intensive, methodical bombing by Central Pacific shore-based aircraft of all defended islands of the MARSHALLS, beginning D minus fifteen Day.
- (b) Destruction of enemy aircraft in the MARSHALLS by carrier attacks on the airfields, on KWAJALEIN, ENIWETAK, WOTJE, and MALOELOP Atolls, beginning D minus two Day.
- (c) Destruction by friendly shore-based aircraft of enemy aircraft, and interdiction of enemy airfields, on MILLE, JALUIT, NAURU, WOTJE, MALOELOP, and WAKE.
- (d) Softening up of enemy defenses, and destruction of supplies on KWAJALEIN Atoll, by carrier and shore-based air attacks and bombardment by new battleships. Destruction of enemy supplies on MALOELOP and WOTJE by cruiser and destroyer bombardment.

- (e) Attacks on enemy naval and merchant shipping by a concentration of submarines in the CAROLINES.
- (f) The operation of four large carrier groups in covering positions with respect to KWAJALEIN Atoll, and the direct support of landing operations by two of these groups, beginning D-Day.
- (g) The simultaneous capture by three naval attack forces of the southern and northern portions of KWAJALEIN Atoll, and of MAJURO Atoll.
- (h) The consolidation of the defenses of the captured positions, and the construction or rehabilitation of airfields for offensive and defensive use.

Capture of ENIWETOK as a part of the MARSHALLS Operations was considered, but owing to uncertainties as to what fraction of the available troops the capture of KWAJALEIN would absorb, operations against ENIWETOK were not prescribed in the major directives. However, tentative plans were drawn up and directives prepared for issue should success at KWAJALEIN prove sufficiently rapid to justify the extension of the operation to the westward.

### TACTICAL PLANS

The ground task force for the MARSHALLS effort included:

- (1) The Southern Landing Force, consisting of the 7th Army Division (Reinforced), assigned the task of seizing and occupying KWAJALEIN Island.

- (2) The Northern Landing Force, consisting of the 4th Marine Division (Reinforced) directed to land, seize and occupy ROI-NAMUR Island:
- (3) The 22d Marines (Reinforced) and the 106th Infantry (Reinforced, less the 2d Bn), were directed to land, seize and occupy ENIWETOK.

The tactical plans adopted for the capture of both the southern and northern halves of KWAJALEIN Atoll involved the following features in common:

- (a) On D Day, the capture of small islands within artillery range of the main positions on KWAJALEIN and ROI-NAMUR Islands, for the purpose of setting up strong concentrations of field artillery for assistance in the capture of the final objectives.
- (b) The capture of islands near ship entrances to the lagoon, and the sweeping of the channels and anchorage areas in lagoons to permit the early entry of fire support vessels, transports and screening vessels.
- (c) The employment of very heavy aircraft bombing and ship bombardments on D Day and D plus one Day, for the destruction of beach defenses, garrisons, gun positions, and stores, as preparatory measures for the main landings.
- (d) Main landings on D plus one Day on KWAJALEIN and ROI-NAMUR Islands, supported by the heaviest possible aircraft bombing.

- (e) The continued support of the advance of the troops by shore, ship, and aircraft bombardment.
- (f) During and after the conclusion of the operations for the capture of the main positions, as troops became available the capture of other defended islands; reconnaissance of all islands of the atoll; sweeping of all passes leading into the lagoon for mines; and a hydrographic survey of the atoll.
- (g) The landing of the garrison forces and the re-embarkation and withdrawal of the assault troops.

#### EXECUTION OF TACTICAL PLAN

In accordance with the tactical plan, D Day was set for 31 January 1944. The landing and occupation of ROI-NAMUR and KWAJALEIN Islands were executed successfully, the capture of ROI-NAMUR being completed on 2 February, while capture of KWAJALEIN was overcome on 4 February.

Units sortied from KWAJALEIN on 15 February capturing ENGEBI on 19 February and ENIWETOK a few days later.

#### STRATEGIC AIR OPERATIONS

For its success with minimum losses to ourselves the MARSHALLS Operation required the early and simultaneous elimination of enemy aircraft from all fields on KWAJALEIN Atoll and within striking distance



thereof. The strength of the enemy on the objective islands indicated the need for a heavier and more protracted bombing than had been conducted in the GILBERTS;

A great fraction of the preliminary bombardment task was discharged by far ranging carrier forces which pounded PONAPE, WAKE, ROI, WOTJE, KWAJALEIN, TAROA, MILLE, NAURU and KUSAIE. Meanwhile the enemy field at MILLE and the seaplane base at JALUIT were neutralized by the land-based aircraft from the newly won GILBERTS bases.

The almost complete absence of enemy aircraft over the target area during the operation testified to the effectiveness of the strategic air operations.

Long range searches were undertaken commencing D minus seven Day for the purpose of obtaining early knowledge of enemy raiding forces which might attempt operations against our assault shipping. The search planes carried out this mission effectively, and were able to destroy a considerable number of small enemy supply craft as well.

### TRAINING

Training of aircraft squadrons in combined operations with landing craft and ground forces in specific preparation for the MARSHALLS Operation was undertaken one month prior to final departure from Pearl Harbor. These exercises included all the features of typical landings with the exception that live ammunition was not used. In addition to participating in flight operations, pilots and squadron intelligence officers visited the amphibious training area and took part in landing craft and ground force exercises in order to familiarize themselves with the equipment used

and the general conduct of surface operations.

### REHEARSALS

Prior to embarkation, rehearsal exercises were held in the HAWAIIAN Islands, which duplicated the air plan for the operation.

This rehearsal brought to light certain weaknesses, and a general conference of representatives of the ground forces and aircraft squadron commanders was held immediately thereafter.

Rehearsals with aircraft held for units of the Fourth Marine Division at Camp Pendleton provided excellent drill for air liaison teams.

### SUPPORT AIR

The performance of close support air activities was more effective in the MARSHALLS Operation than in any preceding Pacific operation. The improvement was due in a large part to prior training and to uniformity in the control system. Air liaison parties, whose effectiveness was so clearly demonstrated at TARAWA, were attached to each infantry battalion and regiment, while over-all control of close air support was vested in the Commander Support Aircraft, embarked in the Attack Force flagship. At Pearl Harbor Marine officers were placed aboard all carriers assigned to the operation to thoroughly brief the pilots on all phases of the MARSHALLS plans. This close liaison proved to be of great value, and after the seizure of KWAJALEIN experienced junior officers were again embarked in carriers assigned to the ENGEBI-ENIWETOK landings to explain the features of those operations to the close support pilots.



During the two days of heavy fighting at ROI-NAMUR, a total of 345 sorties were flown in support of ground troops. On D Day 223 sorties were executed while 122 were flown on D plus one.

In support of troops landing on ENIWETOK, 159 bombing sorties were made along with 206 strafing runs.

Air Coordinators were aloft throughout the day and kept the Commander Support Aircraft advised of the situation, directed certain air attacks and generally maintained a continuous picture of surface activity.

Once troops were established ashore in the ROI-NAMUR phase the execution of close support missions was complicated by the highly restricted land area. On ENIWETOK Island, however, air liaison parties made 28 requests for close air support. Of this number 24 resulted in effective close troop support missions.

### CONCLUSIONS

The part played by air power in the MARSHALL Islands operations laid strong emphasis on certain conclusions which had been indicated in previous operations. Principal among these were:

- (1) Prolonged deliberate accurate air strikes over a long period prior to the main attack are essential in attaining the degree of neutralization necessary to insure successful operations at the beachline.
- (2) The coordination of close air support with ground forces requires careful advance planning and the training of skilled specialists, both flyers and air-ground liaison teams. Prior

training of pilots in close support technique is an essential.

- (3) Subordinate ground commanders must be consulted during the preparation of the overall air plan so that it may be adjusted as far as possible to the exigencies of the small unit tactical plans.
- (4) The responsibility for execution of called air strikes wherein danger to our own troops exists must rest with the ground commander involved.



*Pacific Ocean*



# The Influence of Air Power on the MARIANAS Operations





## THE INFLUENCE OF AIR POWER ON THE MARIANAS OPERATION

### STRATEGIC FEATURES OF THE OPERATION

Early in January of 1944, the Commander in Chief, U. S. Pacific Fleet and Pacific Ocean Areas, distributed, as an aid to long-range planning, his Campaign Plan GRANITE which was based on the decisions of the Joint Chiefs of Staff of 23 December, 1943. This plan set forth the concept and outlined the tentative schedule of operations for the Central Pacific campaign of 1944. Operation FORAGER was included as the final operation in GRANITE and involved the seizure, occupation and defense of SAIPAN, TINIAN, and GUAM in the Southern MARIANAS.

Strategic features involved the following tasks for the air arm of the Pacific Ocean Areas:

- (1) Destruction of enemy aircraft and neutralization of air bases in the CAROLINES, PALAUS, YAP, NEW GUINEA and HALMAHERA by bombardment planes:
- (2) Destruction of enemy aircraft and neutralization of enemy airfields in the MARIANAS, beginning D-4 Day, with occasional raids against CHICHI JIMA, IWO JIMA, YAP, and PALAU, by the Fast Carrier Task Forces:
- (3) Softening up of enemy defenses and destruction of fortifications on SAIPAN, TINIAN, and GUAM, beginning D-2

days, by aircraft of the Fast Carrier Task Forces and by CVEs.

- (4) Scouting and anti-submarine patrols by large patrol planes based on SAIPAN as soon as bases could be established.
- (5) Establishment on SAIPAN of shore-based aviation and its use for troop support and protective missions.
- (6) Support of operations of the Northern Landing Force for seizure of SAIPAN and TINIAN, and for the capture of GUAM by the Southern Landing Force as soon as the SAIPAN situation permitted.

### EXECUTION

It was contemplated that the MARIANAS operation would be executed in three phases: Phase I, Capture of SAIPAN; Phase II, Capture of GUAM; and Phase III, Capture of TINIAN.

Expeditionary Troops, (Task Force 56) was activated on 1 May, 1944, as a task force of the FIFTH Fleet. It was directed, with the support of all forces in the Pacific Ocean Areas, to capture, occupy and defend SAIPAN, TINIAN, and GUAM, and to be prepared for further amphibious operations. Forces were mounted in the HAWAIIAN Islands, SOLOMON Islands, and on the west coast of the UNITED STATES. The Expeditionary Troops for all three phases were organized into the Northern Troops and Landing Force (V Amphibious Corps) for use in Phases I and III; the



Southern Troops and Landing Force (III Amphibious Corps) for use in Phase II, and the Expeditionary Troops Reserve (27th Infantry Division). In addition the 77th Infantry Division was alerted in HAWAII as a General Reserve.

While the original plan had been to use the Expeditionary Troops Reserve as a reserve for both SAIPAN and GUAM, and to capture these two islands simultaneously, it early became apparent that all of the reserve was required on SAIPAN and that the strength of the Southern Landing Force alone was inadequate to insure success on GUAM. It, therefore, became necessary to delay the GUAM attack in order to hold part of its troops in reserve for SAIPAN, and also to provide time for a transport turnaround to HAWAII to bring forward the General Reserve. As a result, the SAIPAN effort was executed alone and the later TINIAN and GUAM operations were concurrent.

Northern Troops and Landing Force landed on SAIPAN on 15 June 1944. The island was announced secured on 9 July 1944. Southern troops and Landing Force landed on GUAM on 21 July 1944. The island was announced secured on 10 August 1944. Northern Troops and Landing Force landed on TINIAN on 24 July 1944. The island was announced secured on 1 August 1944.

PARTICULAR IMPORTANCE OF AIR  
POWER IN THE MARIANAS OPERATIONS

As was true in so many of the other Pacific operations, the chief purpose behind the decision to seize bases in the MARIANAS was the advancement of our air power farther along the road to TOKYO, this time to bases from which all of the JAPANESE home islands could be brought under heavy bombardment from land-based planes. Other results expected to be attained were the isolation of the CAROLINE group and the possibility that the powerful effort would bring to Japanese Fleet to battle.

In addition to being the principle arm to benefit from the MARIANAS enterprise, air power was required to play a powerful part in execution of the operation.

The importance of the role assigned the air arm in the operations for the capture of SAIPAN, TINIAN, and GUAM is emphasized by the proximity of the target area to the JAPANESE home islands, with their many bases and aircraft at least potentially capable of influencing the action. Since this was the largest amphibious operation which had been undertaken in the Pacific up to that time and the first to be fought in the enemy's home waters, the magnitude of the task assigned the air arm was unprecedented with regard to control of the air, neutralization of enemy bases, and scouting missions, as well as the all important close support of the Landing Forces.

Because of the broad expanse over which the air battle was fought in this operation and the complexity of the missions assigned, almost

every known type of modern combat plane from Army, Navy and Marine aviation was called upon at one time or another for general strategic support. However, almost all tactical support was furnished by carrier-borne aircraft. This was particularly true during the preliminary bombardment and early phase of the SAIPAN operation. During the latter phases at SAIPAN and throughout the fighting on GUAM and TINIAN some Army planes (principally P-47's) operating from captured fields teamed with the carrier planes.

#### PRELIMINARY AND COINCIDENT STRATEGICAL AIR OPERATIONS

During the interval between the MARSHALLS and MARIANAS operations, land-based aircraft from the MARSHALLS, South Pacific, and Southwest Pacific, and carrier-based aircraft of Task Force 58, conducted the progressive neutralization of enemy held bases in the CAROLINES. On 9 June daily strikes against major JAPANESE bases in the CAROLINES were initiated by land based aircraft. In addition to raids in the CAROLINES, Fast Carrier Task Forces conducted destructive raids against the MARIANAS and against enemy aircraft installations on WAKE and MARCUS islands.

It is of interest to note that the landings in the MARIANAS were made without the benefit of a long and heavy preliminary bombardment of the target itself by land based aviation. During the assault and occupation stages, however, land based aircraft continued the interdictions of JAPANESE bases in the CAROLINES while Fast Carrier groups

neutralized JAPANESE bases in the BONIN and VOLCANO islands.

Our aircraft operations prior to and during the operation coupled with the interception and defeat of major elements of the JAPANESE Fleet on 19-20 June, proved successful in isolating the battle area from enemy surface forces and from all but small scale air raids. How well the air arm performed in strategic support of the MARIANAS operation is indicated by the comments of the Commanding General Expeditionary Troops in his action report following the operation. "Preliminary air strikes and air support during the operations on SAIPAN, GUAM, and TINIAN proved so effective that complete dominance of the air was gained prior to D-Day".

### TACTICAL AIR OPERATIONS

General. Strike groups for troop support were furnished for the most part by the fast carriers of Task Force 58, while the Anti-Submarine Patrol, Combat Air Patrol, Photographic Planes, Smoke Planes, Air Observer, Air Spotter and Air Delivery missions were performed by aircraft from the CVEs.

The Air Support Plan provided that attacks could be directed either by Commander Support Aircraft from the headquarters ship, Landing Force Commander Support Aircraft, Air Coordinator or Flight Leader. The decision as to which agency to employ was made by the Commander Support Aircraft on the basis of which had the best information available on the particular attack to be executed. In this function



as well as in orienting strike groups in the air the services rendered by the various Air Coordinators was invaluable.

A Landing Force Commander Support Aircraft was landed at each objective with necessary personnel and mobile communication equipment. This control party went ashore with the Landing Force Commander, established the necessary communications, and was capable of taking over control of support aircraft operations.

In some instances the control of attack missions was delegated to the Landing Force Commander Support Aircraft but his principal employment was in the coordination of air operations with artillery fire and in acting as liaison between the Commander Support Aircraft and the Landing Force Commander. Consequently the full control capabilities of this organization were not fully exploited.

### TACTICAL AIR OPERATIONS - SAIPAN

The preparatory bombardment for SAIPAN was limited to carrier and surface strikes beginning on D-4. Aside from these attacks there was no extended preparation of the sort which was so effectively employed preceding the subsequent GUAM and TINIAN phases. The landing was vigorously opposed. Many casualties resulted, and it was obvious that the preparatory bombardment was inadequate and did not approach the optimum neutralization desired.

From dawn until H Hour on D-Day, naval gunfire, with the exception of counter-battery fire, was restricted to the beach areas to a

depth inland of 1000 yards. Support aircraft was assigned the mission of neutralizing all inland active enemy guns and preventing the reinforcement of the landing beach area by attacking enemy troops, vehicles and tanks. Small air patrols were assigned definite areas to accomplish this mission.

A pre-H Hour strike, consisting of 60 VF, 51 VSB and 54 VTB, commenced on schedule at 0700, was completed by 0727, at which time naval gunfire was resumed. This strike was made on previously assigned target areas along the landing beaches.

Prior to H Hour the selection of targets was left almost entirely in the hands of the Air Coordinator and the Flight Leaders. Small groups of planes under their respective Flight Leaders were detached from the Direct Support Groups and directed to patrol definite areas with instructions to attack active enemy guns, troops, tanks, and other targets of opportunity. This plan functioned with a large degree of success, and the same scheme was used after H Hour, with the exception that no aircraft were allowed to make attacks in the general area where our troops were operating without specific instructions from Commander Support Aircraft.

The H Hour strafing attack, composed of 48 VF and 24 VTB, commenced their attack when the leading wave of boats was 800 yards from the beach. The attack continued along the beaches until the leading wave was 100 yards from the beach, at which time the point of attack was moved 100 yards inland. The attack ceased when the leading wave reached



the beach.

The operation against SAIPAN was the first occasion that carrier-based aircraft were in widespread and urgent demand for close support missions. At times there were as many as ten or twelve "urgent" requests for air support. This was particularly true during the first few days, before artillery had been effectively coordinated.

Close support missions varied from heavy bombing and strafing attacks prior to a general advance to missions of two or three aircraft assigned to specific targets. Dive bombing, glide bombing, rocket and strafing attacks were all employed, depending on the type of target and mission.

After artillery had been established, close support missions were confined generally to attacks on targets, which, due to terrain characteristics, could not be effectively neutralized by other supporting arms.

The frequency of requests is evidence of the importance of such missions.

From 17 June until 22 June, few aircraft were available for troop support due to the departure of Task Force 58 incident to the Battle of the Philippine Sea. During this five-day period the air support rendered the ground forces on SAIPAN was limited to occasional flights composed chiefly of aircraft relieved from anti-submarine patrol and combat air patrol. This condition points to the need for the definite assignment of carrier-based air for the support of land operations up to the time that land-based air support is available and functioning.

With the return of surface units, CVE based aircraft of Task Force 52 and P-47 fighters based on ASLITO Field, beginning 22 June, rendered effective close support for the remainder of the assault operations. In addition, the first P-61 night fighters were launched on 24 June and were employed nightly thereafter with limited success.

Aircraft rockets were used extensively on SAIPAN for the first time in a Central Pacific Amphibious operation. In spite of insufficient training in their use and the fact that no delay fuzes were available, rockets proved to be a most valuable weapon.

#### ENEMY AIR ACTIVITY - SAIPAN

There were seventy-six (76) designated enemy raids during the period of 15 June to 7 July, each raid averaging one to three planes for an estimated total of one hundred and fifty aircraft in all. The largest single night raid estimated at twelve planes struck SAIPAN on 21 June. These raids may have originated in the BONINS, TRUK, PAGAN, ROTA, or GUAM but their approach indicated that the great majority came from the ROTA-GUAM area. Although some of these attacking aircraft penetrated the defensive cover, they were for the most part successfully repulsed.

#### TACTICAL AIR OPERATIONS - TINIAN

The actual operation for the seizure of TINIAN may be said to have begun as early as June 11, when the first aerial bombardment and surface shelling of the island was conducted by elements of Task Force 58 in their pre-SAIPAN strikes. Throughout the SAIPAN assault

numerous heavy strikes were directed against targets on TINIAN, and the preparatory bombardment delivered on TINIAN prior to the landings exceeded in duration and deliberate destructiveness any previous preparation of the Pacific war. Carrier-based aircraft of Task Force 52 and Task Force 58 and land-based fighters from ASLITO Field on SAIPAN all teamed in this assault under the direction of Commander Air Support. In addition to the air and naval gunfire bombardment, thirteen battalions of artillery (155mm guns and 105mm howitzers) added their support from positions on southern SAIPAN.

B-25 medium bombers joined in the aerial attack during the assault phase. The large number of aircraft available for troop support made possible both close and deep supporting missions and the repetition of attacks as necessary to destroy small or heavily constructed installations. The experience on SAIPAN emphasized the necessity for the deliberate, unhurried, destructive bombardment of observed targets. This practice was followed, and with gratifying results.

A new technique was introduced for the first time in the assault on TINIAN when fighter strikes were conducted employing Napalm belly-tank incendiary bombs. These bombs were used with notable effectiveness to burn canefields and wooded areas as well as against personnel in caves and open trenches. While more effective than WP and thermite against canefields and wooded areas with a high moisture content, the mixture used still did not produce the prolonged flame desired for such targets.

Air transportation and casualty evacuation were also notable features of the TINIAN operation. After USHI POINT Field was placed in operation on 27 July, transport aircraft operating between SAIPAN and TINIAN were of great value in the transportation of critical supplies and in the air evacuation of sick and wounded. This service was performed at a time when sea conditions made small boat operations extremely difficult.

#### TACTICAL AIR OPERATIONS - GUAM

Task Force 58, beginning on 11 June, had conducted strikes over a period of three and one-half days on GUAM as a part of the preparatory strikes against all the southern MARIANAS prior to the D-Day landings on SAIPAN. When W-Day for the attack on GUAM was postponed, the preparatory strikes by fast carrier forces of Task Force 58 were discontinued until further notice, principally due to the imminence of a fleet engagement. These strikes were later resumed because of the lesson learned from the difficulties encountered in the assault on SAIPAN. During the Battle of the Philippine Sea, however, the enemy airfields at GUAM which were being used as staging positions were struck by the aircraft of Task Force 58, and during the SAIPAN phase of the operation neutralization strikes were repeatedly directed against the fields at GUAM to destroy aircraft enroute from Japanese bases in the CAROLINES to the southward.

On 28 June the full power of Task Force 58 again struck GUAM, bombing and strafing installations and defensive positions as well as



airfields. This represented the beginning of a month long bombardment of the island during which intense, deliberate, destructive fires were delivered against observed targets. Experience had shown the necessity for this type of bombardment against an area as large as GUAM, where the obliteration technique employed on atolls was impractical, and any type of area bombardment inadequate.

As at SAIPAN aircraft contributed materially to the success of the landing force in delivering counter-battery, interdiction, and harassing fires against the enemy. On the night of W-Day, over one hundred planes were used to assist in repelling night counter-attacks on both flanks of the beachhead. Night illumination was maintained and night fighters based on SAIPAN were employed as combat air patrol.

#### CLOSE AIR SUPPORT - GENERAL

Certain noteworthy elements of close air support were common to all three phases of the operation. Among them were the following:

Carrier aircraft with infantry officer observers from each assault division were maintained in position to report the development of the ground situation to the commanding general. These observers reported on separate frequencies and operated more or less independently in carrying out their assigned missions. They were of great assistance to the Commander Support Aircraft in reporting front line positions, in discovery of new targets, reporting targets of opportunity and evaluation of attacks.

Light OY-1 and L-4 type artillery spotting planes were employed in all phases of the operation with excellent results. The cub, or light plane type, was found to be much more satisfactory for artillery spotting than carrier based aircraft, and by the use of cubs, naval aircraft were released for other missions. Since the need for spotting aircraft developed early in the operation, it was emphasized that such planes should be transported to the objective area in a flyaway status aboard CVEs.

Innumerable photographic missions were executed in compliance with requests received. Delivery of the negatives, and in some instances of prints, were made by drop either to the headquarters ship or to the headquarters ashore. Although the photographic missions were of great benefit to the conduct of the operations, they were not entirely satisfactory. Requests for photographic coverage were often made too late and called for photography that was beyond the capabilities of the equipment available. Some of the pilots and personnel of the photographic planes were inexperienced in this highly specialized work.

Smoke-laying planes were employed on only rare occasions -- the most notable example being at GUAM on W-minus-4 Day, when smoke was used very effectively to cover the activities of the underwater demolition teams working on the beaches in daylight. In view of the many small craft available to lay smoke and the availability of WP shells from the fire-support vessels, aircraft were employed for this purpose only as an emergency measure.



## CONCLUSIONS

The MARIANAS Operation was the first large scale amphibious effort to be carried out within the enemy's intermediate defensive arc. Throughout the progress of the operation there were repeated evidences of the decisive part which air would play in the subsequent steps toward JAPAN. Specific conclusions to be drawn from the MARIANAS Operation as regards the influence of air power include:

(1) The preliminary bombardment of SAIPAN was inadequate. Repeated mass precision air attacks are effective in reducing resistance at the beachline. They must be carried out on a systematic basis with intermittent aerial photographic assessments of damage. This conclusion was borne out in the excellent results which developed from the painstaking preparation before the landing on GUAM.

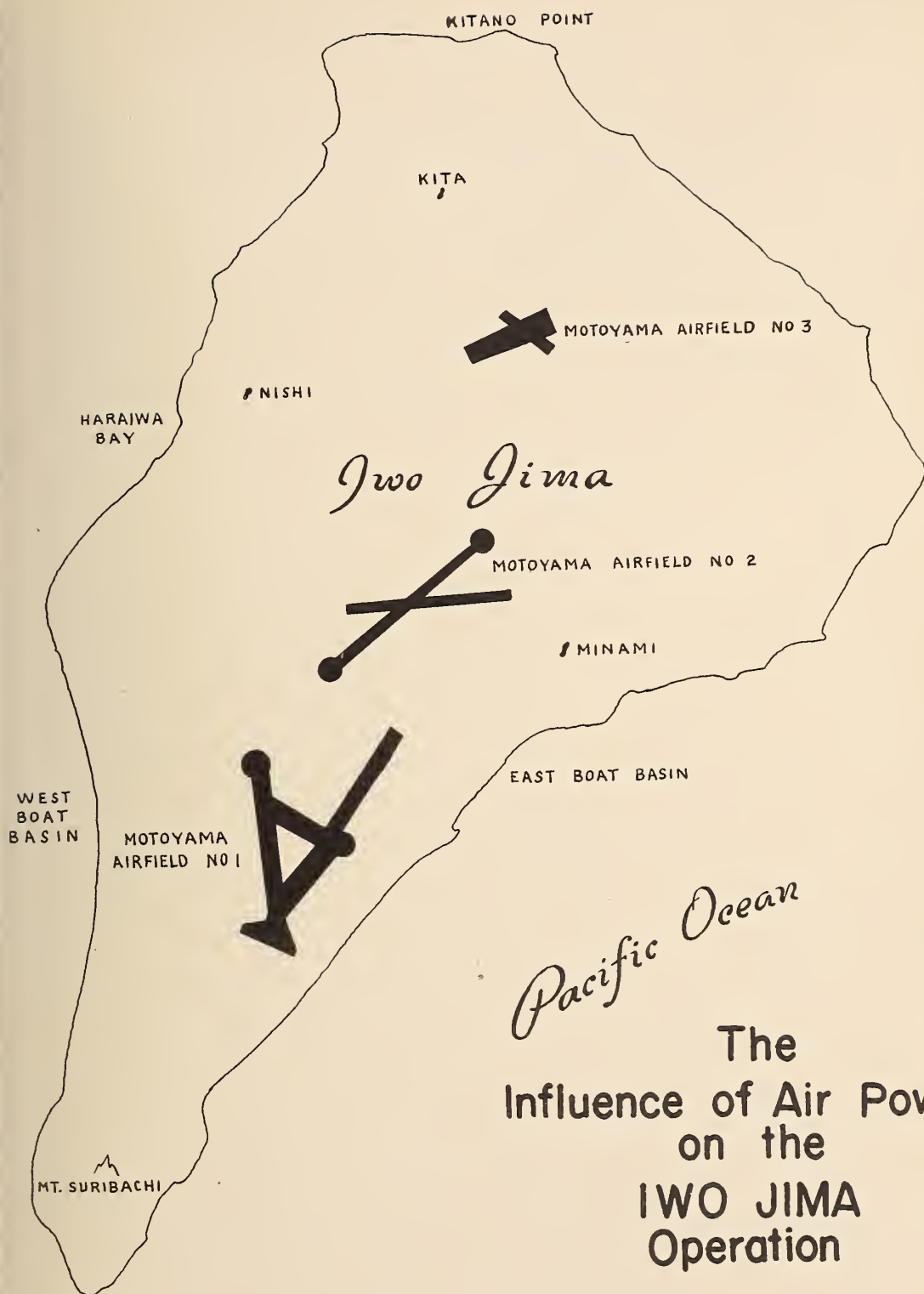
(2) The technique of close air support control as practised in both the III and V Marine Amphibious Corps was sound, and was brought further toward perfection during the operation. The greatest advance was in the formal organization of a shore-based air support control element which, though not permitted to display its full capabilities, was able to demonstrate the vital necessity for further development of such an organization.

(3) Close support air attacks at low altitudes and very close to the front lines were most effective in the reduction of enemy mortar and artillery positions in defilade in the mountainous SAIPAN interior.

(4) A reluctance to release control of an air strike to the front line air liaison party once it had been approved, continued to slow the execution of missions and increase the problems of target designation. It was apparent, as in preceding operations, that air liaison officers of the assault battalions should have direct communication with the Air Coordinator or Flight Leader and should control the strike once it is approved.

(5) The sudden departure of the Fleet for the Battle of the Philippine Sea left the Landing Force without the necessary support aircraft. This added weight to the long stressed contention of the Marine Corps that close support squadrons, embarked in CVEs should be assigned to support the Landing Force as their primary task. Further, since accelerating Fleet activity rendered close support training of fast carrier complements difficult, that the weight of the close support missions should be shifted in a greater degree to Marine squadrons in the smaller carriers.

(6) The value of Napalm and aircraft rockets was clearly demonstrated as was the great advantage in accuracy of dive bombing over glide bombing.



**The  
Influence of Air Power  
on the  
IWO JIMA  
Operation**



## THE INFLUENCE OF AIR POWER ON THE IWO JIMA OPERATION

### STRATEGIC FEATURES OF THE OPERATION.

The capture of SAIPAN, TINIAN and GUAM served to establish our shore-based aviation in localities from which continuous air attacks could be launched against the enemy homeland. However, it became apparent soon after the long range bombing effort was begun that fighter support should be provided at the earliest practicable time in order to insure most effective operation. The provision of such fighter support required capture of an air base along the route between the MARIANAS and the homeland.

At the same time carrier attacks on PALAU, MINDANAO, the VISAYAS and LUZON in the autumn of 1944 revealed a weakness of enemy aviation in their forward areas which would permit an acceleration in the advance of our forces. In order to exploit this situation, however, it would be necessary to advance our air potential to localities from which we could effectively engage enemy aircraft over the EMPIRE itself.

IWO JIMA, key island of the NANPO SHOTO, afforded three sites for airfields, and would provide a fighter base for supporting long range bombers between the MARIANAS and the EMPIRE.

Several divisions were at that time deployed in the South and Central Pacific, from which positions they could be readily mounted for an assault on the NANPO SHOTO. The interval between the LUZON operation and the earliest subsequent operation of comparable size provided sufficient time to complete such an assault.



In consequence a directive was issued by the Joint Chiefs of Staff to CINCPOA, requiring occupation of one or more positions in the NAN-PO SHOTO about 20 January, 1945. The practicability of the operation was based on the assumptions that continued pressure was being maintained from all Pacific theatres on the enemy air force and that adequate forces were available to conduct the assault on IWO JIMA. Circumstances later required a delay in target date until 19 February.

The purposes of the operation as conceived were:

- a. To maintain unremitting military pressure against JAPAN.
- b. To extend control over the Western Pacific.
- c. To establish a base from which to:
  - (1) Attack the enemy homeland.
  - (2) Protect our MARIANAS bases.
  - (3) Cover our surface forces and conduct reconnaissance of the approaches to the EMPIRE.
  - (4) Provide fighter escort for very long range bombers.

Specific tasks envisioned were:

- a. Reduction of Japanese naval and air strength and production facilities in the EMPIRE.
- b. Destruction of enemy naval and air strength in the BONINS.
- c. Seizure, occupation, and defense of IWO JIMA followed by development of an air base on that island.

The Joint Expeditionary Force (Task Force 51), a part of the Fifth Fleet, included the following principal components:

- a. Amphibious Support Force (Task Force 52)

- b. Attack Force (Task Force 53)
- c. Gunfire and Covering Force (Task Force 54)
- d. Expeditionary Troops (Task Force 56)
  - 1. Landing Force (Task Group 56.1) consisting of the Fifth Amphibious Corps (Fourth and Fifth Marine Divisions)
  - 2. Garrison Force
  - 3. Expeditionary Troops Reserve (Third Marine Division)
- e. Air Support Control Units (organized for both seaborne and shore based operation).
- f. Joint Expeditionary Force Reserve.
- g. Transport Screen
- h. Service and Salvage Group
- i. Hydrographic Survey Group
- j. Defense and Garrison Group

Bases in the HAWAIIAN ISLANDS and the MARIANAS served to mount the expeditionary forces, which totalled 111,308 ground troops. Bases in the MARSHALLS and the MARIANAS functioned as regulating stations, providing protection for the sea and air lines of communication and facilities for staging. Harbor facilities in the MARIANAS were employed for the assembly of the combined task force (numbering 495 vessels) prior to the final movement to the objective .

## STRATEGIC AIR ACTIVITIES

The first, or strategic phase, extended over a period of several months preceding 16 February, 1945, during which attacks by carrier and land based aircraft were carried out at periodic intervals against the objective, the neighboring BONIN ISLANDS, the islands of the NAN-SEI SHOTO, and the home islands of the EMPIRE. Assistance was provided by various other forces in the PACIFIC OCEAN-CHINA area as follows:

The 14th Air Force conducted searches from China bases, and provided limited information on enemy surface activity in the CHINA SEA - FORMOSA area.

The Pacific Ocean Areas and Southwest Pacific Area Air Forces conducted long range reconnaissance over the Western Pacific reaches.

The 20th Air Force supported the operation by attacks on the EMPIRE proper in conjunction with the fast carrier strikes.

The fast carriers, whose air groups included a number of Marine Corsair squadrons, carried out heavy strikes on the TOKYO area and then withdrew in order to furnish direct air support at IWO JIMA on D and D plus 1 Days.

IWO JIMA proper was attacked by heavy bombers for seventy two consecutive days prior to the attack. During the last thirty days before the landing the tempo of the raids gradually increased to the point where heavy MARIANAS-based bombers were making at least one daylight attack, interspersed with night harassing missions, every twenty-four hours. Fighter sweeps, photo-reconnaissance and air-sea rescue missions were

conducted as required.

Marine medium bombers (VMB-612) equipped for night attack operations assisted in the blockade of the target area by thwarting enemy attempts to run in supplies and reinforcements in small craft during hours of darkness, obtaining 18 probable kills by rocket attacks.

Evaluation of the horizontal bombing effort indicates that it was less effective than at first anticipated. Destruction of aircraft on the ground and neutralization of the airfields was successfully accomplished although it was frequently noted that runways damaged on one day were repaired within the ensuing 24 hours. However, the effectiveness of horizontal bombing against targets which were even lightly protected proved much lower. Gun emplacements, blockhouses, pillboxes, shelters and other strong points proved to be unprofitable targets for area bombing efforts due to the thorough manner in which these installations were prepared against such attacks. Likewise the rugged terrain with its countless caves afforded excellent protection from the blast and fragment effect of high level bombing.

Results obtained in this operation demonstrated once again that horizontal bombing is effective against aircraft on the ground as well as buildings and vehicles and other installations above ground which are exposed to lateral blast and fragment effect. Likewise, that horizontal bombing is not effective against protected gun emplacements, pill boxes and block houses, unless direct hits are obtained by large calibre bombs, preferably semi-armor piercing. Such direct hits come mainly by chance, and are relatively few in number. Consequently it developed that despite the magnitude of the strategic bombing effort, many of the defensive in-



installations were intact and operative on D Day.

The strategic efforts of the fast carrier task forces produced destructive results, particularly in their attacks on the EMPIRE proper. They demonstrated again the value of precision dive bombing -- photographic interpretation revealing a commendable percentage of hits in the designated target areas. However, the attacks on IWO JIMA itself were of less effectiveness since the defiladed and cleverly concealed defensive installations were difficult to locate, and were difficult to hit even when found.

### REHEARSALS

Rehearsals were carried out first in the HAWAIIAN Area and later at SAIPAN and TINIAN.

The activities in the HAWAIIAN Area took place at MAALAEA BAY, MAUI, and KAHOO LAWE ISLAND during the period 11 to 18 January, 1945. These exercises included both actual and simulated air and naval bombardments.

As had frequently been the case before, rehearsals of air support activities fell short of desired objectives. With the exception of daily anti-submarine patrol, and live bombing and strafing exercises on 17 January, the majority of air support functions and actions were simulated. The exercise was thus principally a test of communication facilities and procedures.

Further it was necessary to substitute locally available squadrons for those actually scheduled to participate. Such an arrangement serves the purpose of meeting requirements of the scheduled use of aircraft, and pro-



vides mechanical drill for members of the air support control units. However, the important element of the training of air groups to be used in the operation and the coordination of these same groups with the control team is lost.

Final rehearsal for the conduct of the operation was held in the MARIANAS ISLANDS on 12 and 13 February, 1945. In this exercise it was possible to effect a truly realistic rehearsal of the direct air support functions because of the convenient appearance and participation of both the fast carrier and CVE air groups which were scheduled to take part in the actual operation. However, the Landing Force Air Support Control unit was not landed, and insofar as this unit was concerned, the rehearsal was merely another communications drill.

## TACTICAL AIR OPERATIONS

### General

The fast carrier task force, upon completion of the TOKYO attacks, withdrew to the vicinity of IWO JIMA, where on D Day, 19 February 1945, its strength supplemented that of the small carriers.

The pre H-Hour strikes against the beach and flanks were exceedingly well executed and were effective in accomplishing the neutralization of the beaches during the critical period of approach and landing of the first waves. Seventy two (72) fighters and bombers attacked the beaches, flanks, and adjacent areas with rockets, bombs and machine guns at H-55 minutes, followed by a separate group of forty-eight (48) fighters which

dropped Napalm, fired rockets, and strafed these areas. Approximately 45 Army heavy bombers were scheduled to take part in the pre H-hour strike. Of this number about one third reached the target and dropped bombs. The remainder, failing to arrive on time, were directed to return to their base.

The support group CVEs continued to provide aircraft for support missions throughout the assault and occupation phases. Their number was augmented by fast carrier aircraft from D Day to D plus 3 Days, after which the fast carrier task force struck the BONINS and TOKYO, returned again to the vicinity of IWO JIMA and then departed for a sweep through the NANSEI SHOTO.

The CVEs provided aircraft for close support call missions, pre-jump off strikes, day combat air patrol, anti-sub patrol, naval gunfire spotting by specially trained fighter pilots, tactical air observation and artillery spotting by trained Marine observers, photographic missions, air distribution of propaganda leaflets, and insecticide spraying. One carrier from Task Force 58 provided night combat air patrol until forced to withdraw from the area due to battle damage. Another fast carrier then assumed these highly important patrols as well as the performance of intruder missions against the BONINS. Navy flying boats operating from a base near the southern end of East Beach performed search and air-sea rescue missions, and mail runs.

As soon as garrison aircraft could be accommodated at South Field Iwo, they flew in from SAIPAN. The first were Army P-51 day fighters and P-61 night fighters which arrived on 6 March 1945, and took over

local day and night Combat Air Patrol. Two days later additional P-51s and a squadron of Marine torpedo bombers arrived. By 11 March all tactical air support at IWO was provided by shore-based aircraft operating from the captured fields.

Defensive air cover, as provided by the Carrier Support Groups and the Garrison Air Forces, was adequate and effective. It was rare that enemy aircraft succeeded in closing the objective area although frequent attempts were made by single aircraft and small formations both by day and night. The largest and most destructive of such attacks was made on D plus 2 Day by enemy planes which divided into small groups for the purpose of striking at our carrier forces and amphibious craft. In this engagement 16 enemy planes were destroyed - one by the Combat Air Patrol and 15 by ships' anti-aircraft fire.

The lack of effectiveness in the enemy air intervention may be attributed to the small number of planes which the Japanese were able to commit to the action. The destructive raids on EMPIRE fields as well as those in the NANSEI SHOTO had indeed isolated the battlefield. This is in sharp contrast with the situation which obtained in the early days of the OKINAWA campaign, wherein complete isolation of the battle area was not achieved. (See OKINAWA Operation below.)

#### CLOSE AIR SUPPORT

IWO JIMA provided a difficult test for the close air support technique which had been in the process of steady evolution since GUADALCANAL. The tortuous weird terrain, thoroughly organized and well

camouflaged as it was, rendered aircraft orientation extremely difficult, and the irregular character of our front lines added immeasurably to the difficulty of delivering effective strikes close to the assault elements. Despite all of these difficulties, close air support was extensively employed, and contributed heavily to the final outcome of the operation.

Initially the close air support responsibility was discharged by Navy and Marine planes flying from CVEs and CVs. These squadrons, which had participated in rehearsals with ground forces at SAIPAN, functioned with great effectiveness. From D-Day (19 February) until carriers were withdrawn, these planes conducted 188 direct support missions including 2719 sorties, dropping 854 tons of bombs and firing 8501 rockets.

The great effectiveness of Napalm in destroying camouflage was demonstrated again, as at TINIAN and the 5" rockets proved extraordinarily accurate in destruction of fixed emplacements. The close quarters at which it was necessary to deliver supporting strikes rendered low level approaches essential. These, in turn, were complicated by a shortage of delay fuzes for bombs. Forced to employ instantaneous fuzes, pilots were continually subjected to the hazard of bomb blast. Despite this difficulty the close air support rendered was of a high order.

Upon withdrawal of carriers from the area it was necessary to pass the close support task to the Garrison Air Force. Army P-51 squadrons were assigned this mission. Since the Army pilots were entirely unfa-



miliar with air-ground technique, it was necessary, despite the urgent press of events, to take time to provide them with a brief indoctrination. They were given oral instruction at Landing Force Headquarters followed by practice runs on small islets around IWO. Thereafter, they were assigned missions at considerable distances behind the enemy lines and were gradually moved closer as their technique improved.

This provides a clear example of a fundamental, though not well known point of variance which existed during the war, between the Army on one hand, and the Navy and Marines on the other, in the matter of tactical assistance to ground forces by aviation units. Navy and Marine air units concentrate heavily on the perfection of the technique of close support for forces on the ground. The Army Air Force, however, considers this practice to be relatively unprofitable, and lays no stress on its development.

Air support control, as practised at IWO JIMA, closely approached the pattern for which Marines had been striving since the first operation in the Pacific. Trained air liaison parties were present in each battalion, regiment, and division, and a well organized Air Support Control Unit was in operation in the USS ELDORADO, flagship of the Joint Expeditionary Force Commander. The extremely critical tactical situation ashore interfered to some degree with air support communications and encouraged a degree of over-centralization of control in the Air Support Control Unit. This tendency, noted in previous operations, occasionally reduced the rapidity with which supporting strikes were executed.



It had been clearly determined in the operation on SAIPAN (see MARIANAS Operation above) that the organization of a shore based air support control unit was required. Such a unit was provided for the IWO JIMA operation. It was established ashore and assumed control of all close support air operations from 1 March through 15 March, when close air support was no longer required. The excellent liaison which this unit was able to maintain with Landing Force Headquarters produced a considerable acceleration in the speed with which support missions were conducted.

A forerunner of the Target Information Center control scheme which was later used with such effectiveness at OKINAWA was developed at IWO for coordinating air attacks with artillery fire. Each air strike was given a number and the following information was included: Time bracket, target area, direction of approach and retirement, number and type of aircraft, minimum altitude and any other pertinent information. The artillery was thus able to control its fire so as not to interfere with strikes, and a complete shut-down of artillery was necessitated only on rare occasions in order to run a tree top level Napalm attack. Whenever two or more battalions of artillery were firing on the same target, that information was passed to the Air Support Control Unit with the maximum ordinate, and aircraft were warned to keep clear.

#### AIR DELIVERY

The Air Delivery Section of the V Amphibious Corps, consisting of three officers and eighty-one enlisted men, was established on SAIPAN to support the IWO JIMA Operation with air drops or air freight delivery.

During the ensuing twenty-three days, seventeen supply missions were executed, all accomplishing the 1400 mile round trip without serious incident.

The first seven missions were executed by parachute drop and the remainder by air freight delivery. Five-hundred and eighty-nine parachutes with containers or slings were used in dropping seventy-eight tons of cargo, while forty tons were delivered by air freight. Forty-eight C-47s and eighteen C-46s were used to carry the supplies requested.

Air delivery operations began on 28 February when three SAIPAN-based C-46 planes made the first drop to forces on IWO JIMA, and on the following day mail was delivered in the same manner.

### CONCLUSIONS

In a period of approximately three weeks from the day of the landing, IWO JIMA was transformed from a strong point of Japanese defense to an Allied air base of great strategic and tactical importance in the over-all air offensive against the EMPIRE. Its capture and development denied its use to the Japanese as a defensive position in the path of our B-29s based in the MARIANAS, and as an offensive weapon against those same bases. It immediately paid dividends by affording an emergency haven for aircraft returning from raids against the EMPIRE which otherwise might have been lost. It provided an advance base for search and reconnaissance. It further provided a base within fighter range of the EMPIRE. Although the range was long, fighter sweeps or escorted bombing raids

proved practical, permitting daylight attacks at lower altitudes, with resulting increased accuracy and greater security than otherwise would have been possible. It afforded a staging point for bombers, permitting greater bomb loads in lieu of gasoline, as well as a refueling stop for short range aircraft enroute to possible future bases.

In addition to the general results developing from the IWO JIMA Operation, the following specific conclusions may be drawn in regard to the influence of air power:

- (1) Strategic bombing efforts are of greatest effectiveness when brought to bear on the enemy's concentrated primary sources of power, and are of much less effect when dispersed on other missions.
- (2) Horizontal bombing is relatively ineffective, except on area targets - and then mainly in those cases where the targets are not protected by concrete or earth. Particularly unprofitable targets for horizontal bombing are those requiring precision registration and those which are underground.
- (3) Dive bombing is more effective than horizontal bombing against precision targets, but is seriously hampered also by concrete protection and underground installations.
- (4) Close air support, as practised by the Marine Corps and Navy, contributed materially to the success of the operation, and is founded on sound doctrine.
- (5) Close air support technique must be developed by progressive education and combined training. The necessity for such

procedure was clearly demonstrated in the weakness of the Garrison Air Force P-51 squadrons.

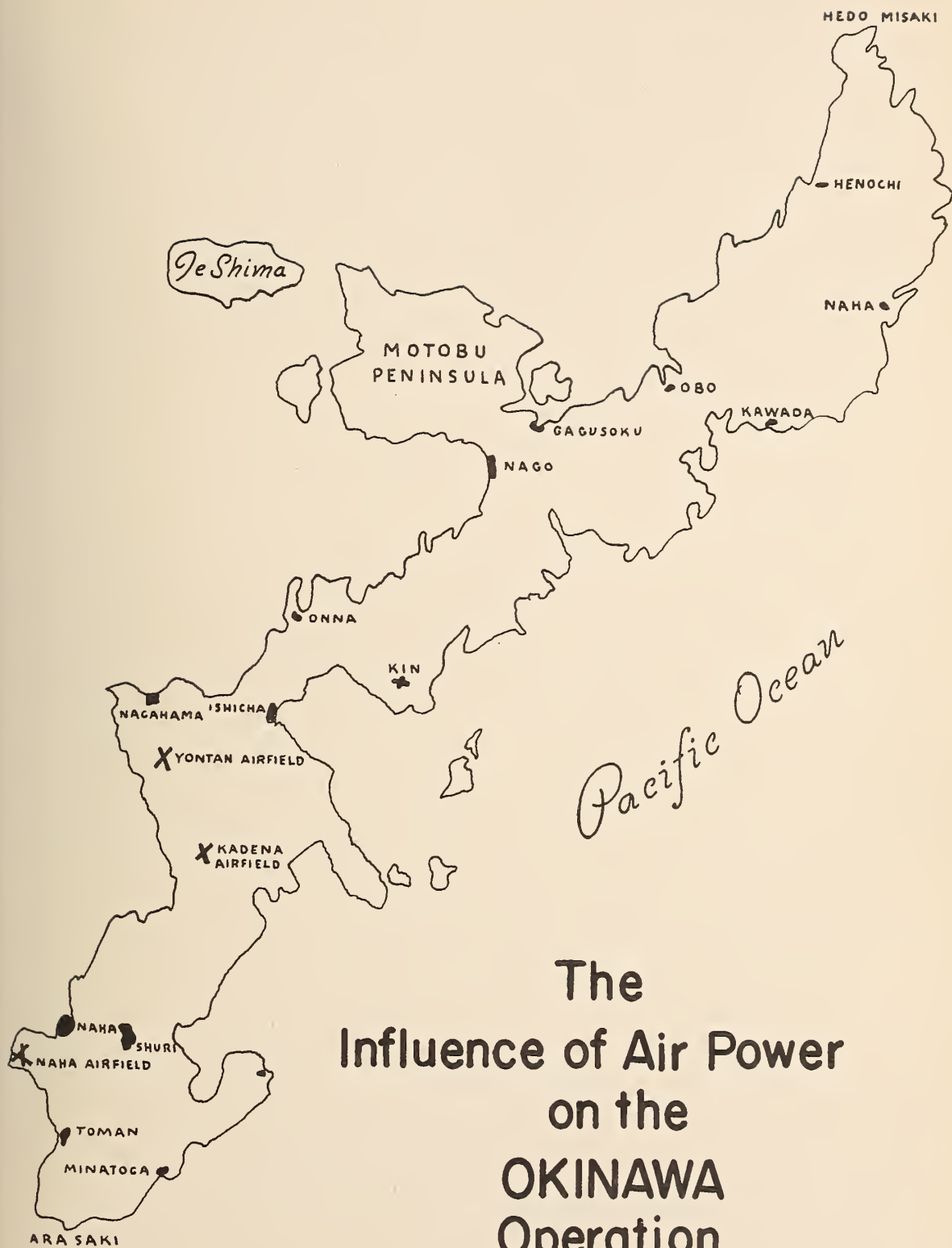
- (6) The necessity for heavy bombs was re-emphasized, along with the need for delayed action fuzes.
- (7) The employment of a shore based Air Support Control Unit was shown to be an essential factor in the maintenance of effective control, once the senior ground echelon is established ashore.
- (8) The need for some form of coordinating body to resolve the operating problems of air, naval gunfire and artillery was apparent.

THE INFLUENCE OF AIR POWER ON THE OKINAWA OPERATION  
STRATEGIC FEATURES OF THE OPERATION

The Joint Chiefs of Staff having directed the capture of one or more localities in the NANSEI SHOTO to provide strategically located sea and air bases in the advance on JAPAN proper, the Joint Expeditionary Force (Amphibious Forces, U. S. Pacific Fleet) as part of the FIFTH Fleet was assigned the mission for the capture, occupation and defense of the OKINAWA GUNTO. The FIFTH Fleet was assisted by other forces under the control of the Commander in Chief Pacific Ocean Command and a British Carrier Task Force. The strategy employed in this operation may be described as follows:

- (a) OKINAWA and its satellite islands provided excellent facilities for establishment of the airfields necessary to maintain continuous air operations against the JAPANESE homeland and to interdict the already tenuous lines of communication between JAPAN proper, the CHINA COAST and the remote areas of the imperialist empire. Once again an amphibious enterprise was mandatory as a means of placing air power in a position to exert its influence in the advancement of offensive strategy.
- (b) The WEST COAST of the UNITED STATES, the HAWAIIAN ISLANDS, MARIANAS, MARSHALLS, CAROLINES and LEYTE in the PHILIPPINES served as bases for the operation.





# The Influence of Air Power on the OKINAWA Operation



- (c) The Amphibious Support Force and Gunfire and Covering Force, commencing LOVE minus SEVEN Day with Naval Gunfire and air bombardment, struck OKINAWA and the satellite islands of the KERAMA Group to soften the enemy defenses, to destroy his aircraft, neutralize his airfields, sweep the waters of mines, and provide protection against hostile surface and air units so as to insure the safe and uninterrupted approach of the Attack Force and subsequent landing of the Expeditionary Troops. These forces continued this function throughout the course of the operation.
- (d) The Fast Carrier Force struck the EMPIRE, FORMOSA, the SAKISHIMA GUNTO and OKINAWA GUNTO prior to LOVE Day to destroy enemy aircraft and air installations and to soften up enemy defenses which might interfere with the OKINAWA operations. This force later provided air cover and direct support at OKINAWA and covered the front and flanks against hostile and potential surface attack by strikes on the EMPIRE and by destruction of a hostile surface Task Force.
- (e) A British carrier task force operating under, and in conjunction with the FIFTH Fleet, assisted in the neutralization of FORMOSA and the SAKISHIMA GUNTO and covered the western flank against hostile surface and aircraft.
- (f) Search planes based at KERAMA RETTO and OKINAWA sup-

ported the operations through air reconnaissance of the EAST CHINA SEA and attacked hostile shipping and aircraft, while other aircraft conducted anti-submarine patrol, air-sea rescue and photo reconnaissance.

- (g) The Strategic Air Force Pacific Ocean Area operating from bases in the MARIANAS, struck OKINAWA GUNTO from time to time prior to LOVE Day for the purpose of softening up the enemy, destroying his aircraft, neutralizing his fields, destroying his shipping and further engaged in photo reconnaissance and air-sea rescue. With the capture of IWO JIMA, fighter aircraft based on that island covered heavy bombers from the MARIANAS in strikes on the EMPIRE in accordance with the general softening up plan, and provided cover and protection against hostile surface and aircraft on the eastern flank.
- (h) The 21st Bomber Command of the 20th Air Force, operating from bases in the MARIANAS, contributed to the general softening up by strikes on the EMPIRE, coordinating its strikes with those of the fast carriers and increased the frequency and strength of its strikes on the airfields and installations on KYUSHU to neutralize and destroy those installations in order to minimize the employment of hostile aircraft against our forces at OKINAWA.

- (i) The Submarine Force Pacific Fleet carried out reconnaissance, attacked enemy shipping, engaged in lifeguard service, conducted photo missions and provided weather reports.

The operations for the capture of OKINAWA GUNTO served as a fitting culmination of all of the developments in tactical doctrine, air, sea, and ground arising from previous experiences in the Pacific war. In terms of ships employed (over 1200) troops involved (over 450,000) aircraft engaged (over 10,000), and the magnitude of the problems and distances involved, the operation was the largest naval and amphibious enterprise in the whole of the Pacific War. It provided a mammoth testing laboratory for all the techniques and materials which had developed during the entire westward advance.

### STRATEGIC AIR ACTIVITIES

All air activities which were undertaken in the general theatre of operations prior to L-Day but which are considered to have had any specific connection with the operation will be classified as strategic air activities for the purposes of this discussion.

Commencing in October of 1944, fast carrier elements of the Third and Fifth Fleets undertook destructive attacks on shipping and harbor installations within the whole of the RYUKYU chain. Between this time and 15 March, 1945, the strategic bombing effort succeeded in seriously crippling the logistic capabilities of all harbors on the island of OKINAWA



by sinking within those harbors large quantities of shipping. Urban and industrial areas were burned and, from subsequent accounts furnished by local residents, normal existence was considerably disrupted. The strategic attacks accomplished only negligible destruction of supplies, equipment and the means for conducting the defense of the island. This was true mainly because of the extensive employment of underground storage, and extensive above ground dispersal.

In company with, and in a far lesser degree than the submarine effort, the strategic air attacks prior to 15 March succeeded in seriously interrupting the movement of shipping between the EMPIRE and the RYUKYU chain as well as between the RYUKYUS and FORMOSA. This effort was, however, not of sufficient effect to prevent the movement during January 1945 of an infantry division from OKINAWA to FORMOSA, and during February of that year the subsequent movement of a replacement division from KYUSHU to OKINAWA.

Commencing on 1 March and continuing for the following fifteen days, the 20th Bomber Command struck FORMOSA with all available sorties. The combination of weather restrictions and other demands reduced to some degree the effectiveness of these strikes and it was found that shortly after L-Day airfields on FORMOSA were still operative and planes were being launched therefrom for attacks on OKINAWA.

The 21st Bomber Command executed strikes on OKINAWA during the period 1 March to 20 March 1945, and struck air installations on

KYUSHU from 21 to 26 March inclusive. The 14th Airforce attacked HONG KONG during the period 16 to 18 March in support of fast carrier operations against FORMOSA. The fast carrier task force struck FORMOSA, the PESCADORES, and SAKASHIMA GUNTO air installations on 16 and 17 March, and attacked air installations and fixed defenses in the OKINAWA area on 21, 22 and 23 March.

Carrier aircraft of the British Pacific Fleet undertook to maintain neutralization of FORMOSA, the PESCADORES and SAKASHIMA GUNTO air installations after 20 March.

During pre-landing attacks on OKINAWA one CVE was assigned the task of dropping propaganda leaflets. This effort, under the control of the Commander Air Support Control Unit, succeeded, according to subsequent investigations, in placing a large number of the leaflets in the hands of enemy civilians. Their success with regard to the military was inconclusive.

It will be seen that the preponderance of the preliminary air effort was concentrated in one direction - neutralization of enemy air installations which existed within an effective striking radius of the target. For this purpose the whole weight of American air power in the Western Pacific was concentrated on enemy airfields included within the KYUSHU-CHINA COAST-FORMOSA triangle. As a result of this all-out concentration, hundreds of planes were destroyed on the ground and a considerable number in the air as well. Ground installations were fired and runways were cratered. But, on L-Day the enemy was still able to put

aircraft in the air over the target area in considerable numbers. The strategic air effort, as was demonstrated on frequent occasions during all of the operations preceding OKINAWA, produced only temporary results in its effect on enemy air installations. So long as the enemy retains replenishment sources outside the arc of neutralization, those installations which are temporarily neutralized can be swiftly reestablished following cessation of our interdictory efforts. Thus it was that while the mammoth task force made its approach under conditions of almost unbelievable peace and quiet since the whole of the American air effort was bent on achieving this end, as soon as the neutralization attacks were released, particularly in the case of KYUSHU, heavy air attacks on our fleet units in the OKINAWA area were initiated. It may be concluded then, that our strategic air activities accomplished the important task of covering the approach of the Landing Force, and in so doing destroyed a large number of aircraft which might subsequently have been used effectively in opposing our offensive efforts on OKINAWA. But it must also be concluded that the strategic attacks were not conclusive in achieving destruction or even continued neutralization of enemy installations in and around the target area, since to be totally effective strategic aircraft must search out and destroy the enemy's power at its source.

During the progress of the OKINAWA campaign, strategic attacks on KYUSHU airfields were continued during the period 13 - 16 May by Task Force 58. These succeeded in temporarily neutralizing airfields

from which enemy planes were launching effective attacks at our forces and in the destruction of a large number of grounded aircraft thereon.

### REHEARSALS

The Northern Attack Force (III Phib Corps) engaged in rehearsal exercises in the GUADALCANAL area from 1 - 8 March while the Southern Attack Force (XXIV Army Corps) conducted its rehearsals in the LEYTE area from 14 - 21 March. Support carrier units Three and Five, accompanied the Northern and Southern Attack Forces on their respective rehearsals and provided necessary air cover while participating in the air support phase of the rehearsals on a token basis. Commander Air Support Control Unit of the Joint Expeditionary Forces did not participate directly in the rehearsals. In the case of the Northern Attack Force, the air participation in rehearsal was of such small dimensions as to render it quite ineffective and the force set sail for the target area with a total inadequacy of exercise involving the air forces and ground troops whom they were subsequently to support. In this respect the rehearsals were quite similar to those in preceding operations wherein difficulties of a simple nature which developed in the operation itself might well have been eliminated by thorough rehearsal.

### TACTICAL AIR OPERATIONS

Tactical air activities considered herein include combat air patrol, close air support and air-ground supply. Tactical aviation elements contributed by the Navy to the conduct of the OKINAWA operation consisted of a Fast Carrier Task Force, including an average of 5 CVs and



5 CVLs and a Support Carrier Group including an average of 15 CVEs. The planes from these vessels participated in the various tactical phases as the immediate situation dictated.

The Tactical Airforce, 10th Army, was a composite Marine-Army organization, including Marine fighter bombers, night fighters, torpedo bombers, and Army pursuit and reconnaissance aircraft. The Marine aircraft arrived commencing on 7 April and initiated operations immediately. Army photographic aircraft arrived on 22 April, and Army fighter aircraft on 13 May. Distant support efforts were initiated on 17 May with a strike against KYUSHU airfields.

Throughout the operation tactical aircraft, both carrier and land based, made a powerful contribution to the progress of the operation by their defensive efforts. During the period 1 April to 21 June, there were a total of 1547 enemy planes destroyed in the OKINAWA area. Of this number over 46% were shot down by our defensive air patrols. It may be of interest at this point to note that 51% were destroyed by ships' anti-aircraft fire while the remaining 3% were shot down by ground anti-aircraft. During the same period our own plane losses aggregated 143 aircraft, of which 64 were casualties to enemy action.

The 1547 Japanese airplanes destroyed by our defensive efforts were engaged in the execution of three coordinate missions:

- (1) Destruction of the screen of radar picket craft,
- (2) Destruction of the covering naval forces,
- (3) Destruction of the transports, cargo vessels, and other



elements of the amphibious forces which were providing the impulses of power for continuation of the OKINAWA operation.

Success in the execution of these missions would have gone far toward defeating the OKINAWA venture. But that success was not achieved. While serious inroads were made on the supporting naval vessels and craft (29 sunk, 203 damaged) the combination of sea and air anti-aircraft defenses provided adequate protection for the relatively defenseless troop and cargo carriers lying in the roadstead.

In the destruction of half of the enemy aircraft for which credit is claimed, (and it is estimated that over three-fourths of the Japanese planes which sortied for OKINAWA never returned), it will be seen that the tactical efforts of aircraft in defense of the landing area were of large dimensions. It will, however, be of considerable surprise to many to note that this powerful air defense was still secondary in its destructive effect to anti-aircraft fire and further, that the greatest single opponent of the Japanese plane was the naval anti-aircraft gun.

#### DIRECT SUPPORT AIR OPERATIONS

All of the experiences of preceding operations in the advance across the Pacific took part in the preparations for providing direct air support in the OKINAWA campaign. Seven air support control units were organized and embarked in command ships for the control of aircraft in the various phases of the operation. Three Marine landing force air support control units were provided with uniformly trained

air liaison parties and these parties were in turn equipped with the latest type of air-ground communication equipment.

The unexpected surprise which developed on L-Day in the form of light and scattered enemy resistance, resulted in request by Marine elements of the 10th Army for only two strikes. Ten missions were requested on the following day, and ten on the next. The number remained modest thereafter until 10 April when elements of the Sixth Marine Division met the first stiff resistance in the Third Amphibious Corps zone of action on MOTOBU PENINSULA. On this day, Landing Force Air Support Control Unit No. 1, functioning in support of the Third Amphibious Corps relieved the Northern Attack Force Air Support Control Unit embarked in the PANAMINT, and from this time forward, control of support aircraft was conducted from shore based headquarters. During the succeeding twelve days, under difficult mountain conditions, close air support made a considerable contribution to the success of the Marine units in reduction of the strong MOUNT YAETAKE stronghold. Certain weaknesses were clearly pointed out during this period. Among these were:

- (1) Failure of aircraft to report on station at the appointed hour.

Since airplanes which supported the operations on MOTOBU PENINSULA were carrier based, it was frequently found that enemy air intervention, particularly in the form of suicide attacks, or the apprehension of such intervention caused carrier commanders to prevent aircraft from taking off in time to reach the rendezvous at the appointed time. Likewise fighter aircraft,

carrier based, were on occasion diverted to combat air patrol missions in preference to execution of the scheduled close support effort.

- (2) Aircraft conducting support missions were often forced to withdraw for their own safety during enemy air attacks.
- (3) The aircraft employed in this early phase of the OKINAWA campaign were piloted by naval personnel. The particularly rugged character of the terrain on MOTOBU PENINSULA emphasized the extreme difficulty under which any pilots who are unschooled in terrain evaluation must operate.
- (4) While the Sixth Marine Division functioned on the principle that all close support air activities should be directed and controlled by the front line air liaison parties, it was required by Commander Amphibious Forces, Pacific Fleet that the Air Support Control Unit direct the conduct of all strikes.

From 22 April until 1 May, there was little requirement for close air support by the Marine Corps units since the northern two-thirds of the island had been secured and the Marines had not yet been called upon to participate in the attack to the southward along with the XXIV Army Corps. On 1 May, the First Marine Division was committed on the right flank of the 10th Army. Thereafter close support operations flown by Marine and Navy aircraft contributed materially to the advance of the Division. On 9 May, the Sixth Marine Division was committed on the right of the First Division and thereafter the Third Amphibious Corps

drove southward with divisions abreast. Close support aircraft were repeatedly called upon to execute missions in close proximity of the front lines and there are only three recorded cases out of a total of over 7,000 sorties wherein bombs were dropped behind our front lines. During the bitter operations aimed at the capture of SUGAR LOAF HILL, air liaison parties repeatedly called strikes within 125 yards of our front line troops, without injury to our own personnel and with great damage to the enemy.

Of particular accuracy were the close support strikes employing five inch rockets. During the crossing of the ASA KAWA ESTUARY, heavy defenses were encountered, deeply entrenched in cliff-side cave positions. The neutralization of these positions was attempted with all weapons at hand but the vertical cliff face defied destruction by all ground means. Front line air liaison parties accordingly called in Marine fighter aircraft, armed with rockets, and spotted the attack into the obscure cave positions, resulting in effective neutralization. Captives repeatedly stressed the terror and demoralization which followed these rocket attacks. They expressed amazement and curiosity concerning the technique which would permit our aircraft to fire missiles of such destructive qualities in close proximity to our own front lines.

As the operation progressed, the great value of Napalm was further developed. It was initially considered that Napalm's most effective employment was in the incineration of enemy forces entrenched in



pill boxes and caves. It was soon discovered that this employment was not extremely effective but that Napalm was most useful in the destruction of cunningly placed enemy camouflage preliminary to rocket attacks. Front line air liaison parties frequently employed heavy Napalm attacks to completely denude a suspected hillside of all growing matter in order to expose Japanese positions.

Throughout the operation there was repeated evidence that 1000 and 2000 pound bombs were by far the most effective in operations against heavily fortified positions. During the repeated assaults on the SHURI CASTLE position, air liaison parties of the First Marine Division employed bombs up to 2000 pounds capacity by direct support means without damage to front line troops. Indeed it was noted that in the attack on such positions, the employment of bombs of smaller size was of so little effect as to not warrant their use.

A sound index to the actual tactical value of any weapon or offensive means may be found in the degree to which that means is employed. As an evidence of the tremendous effectiveness of the close air support rendered during the OKINAWA campaign, the following figures merit reflection:

- (1) During the whole of the OKINAWA campaign, Marine elements employed direct support aircraft on a total of 562 missions, some missions comprising as many as 75 aircraft.
- (2) 1805 tons of bombs were dropped in the conduct of direct support activities.



(3) 15,865 rockets were fired.

(4) 683 tanks of Napalm were dropped.

While this is a treatment of the influence of direct air support on the Marine ground phase of the OKINAWA operation it is considered most significant to note that the XXIV Army Corps, provided with Marine air support control personnel on the same basis as the Third Marine Amphibious Corps, likewise found close support aircraft to be of exceptional value. In his report on the operation, Lieutenant General J. R. HODGE, Commanding General, XXIV Corps, makes this comment, "Support aircraft were employed extensively in direct support of the ground operations throughout the campaign.....All support aircraft, except a few photographic planes were of the carrier type, manned by Navy and Marine personnel".

The Commanding General, 7th Infantry Division, in his comments on air support noted that, "Division air support during this campaign was provided by Navy and Marine airforces and coordinated through air-ground liaison teams furnished by the 75th JASCO.....In the main, both attack and reconnaissance missions were very successful. Ground forces attacking with close air support were materially aided in taking enemy strong points and suffered no casualties from the front line air".

The Commanding General, 96th Infantry Division, noted in his action report that, "The close air support received by the division during this operation was superior throughout."

The XXIV Corps during the whole of the OKINAWA campaign, received a total of 817 strike missions, averaging twelve per day for the

first seventy days, and on one occasion 43 missions were executed in one day, one such mission numbering 139 aircraft.

From the foregoing it will be seen that efforts initiated by the Marine Corps in the two preceding decades, had attained a high state of effectiveness. The painstaking training of pilots in all the characteristics of the ground problem and their varied education in the technique of close air support demonstrated the effort expended to have been well directed. OKINAWA provided full opportunity for the highly trained Marine Corps close support aviators to demonstrate their effectiveness. The comments of the ground teams whom they supported, both Marine and Army, are adequate testimony to the quality of their support and to the contribution which they made toward the successful decision of the issue on OKINAWA.

#### SUPPLY BY PARACHUTE DROP

Following the collapse of the enemy's position on SHURI HEIGHTS, and his withdrawal to a final defensive position, along the YAEJU DAKE ESCARPMENT, heavy rains rendered all supply routes entirely impassible. The momentum of the operation, totally dependent at this point on its logistical support, would have failed entirely without the delivery of supply by aircraft. The First Marine Division and the 77th Infantry Division were particularly isolated by the inclement weather and depended almost entirely upon air drop for the supply of their front line troops. During the last week in May and the first week in June, over 600 supply

sorties were flown, executing parachute drops totalling over one-half million pounds of all types of supplies, from food and ammunition to fragile medical supplies and equipment. The technique of executing air supply missions is a difficult one involving particular education on the part of the pilots and specially trained and equipped personnel for packing the parachutes and preparing the supply drops. The Marine Corps recognizing, since early NICARAGUA days, the vital importance of air-ground supply, had made provisions for this contingency by the organization of two parachute air delivery units, one for each of the two Marine Amphibious Corps. These units, composed of qualified parachute personnel, who had received their early training effecting parachute supply in the SOLOMONS campaign (see BOUGAINVILLE Operation), were embarked in escort carriers and later established ashore at KADENA Airfield. There, in company with Marine Torpedo Bomber Squadron 232, operations to supply the front line units were effectively undertaken. Pilots of VMTB 232, skilled in close air support work, were coached on their front line supply drops in the conventional air support control methods by front line air liaison parties. Even under situations of most adverse weather, where it was necessary to fly by instruments and drop by radar location methods, the delivery of supplies to front line units was maintained.

The value of the air delivery contribution is best characterized by the Commanding General XXIV Army Corps, in his action report where he states, "During the latter half of May and the first week of June, when vehicular movement was practically impossible because of heavy

rains, air support units supplied forward elements by air drop. This assistance was invaluable and enabled our infantry to continue its operations and its forward movement in pursuit of the retreating Japanese force''.

These successful air supply operations are a powerful commentary on the realistic and farsighted conclusions which have resulted from the close air-ground cooperation within the Marine Corps. This cooperation, as manifestly evidenced in this single example, has paid tangible dividends in terms of ground gained and Japanese soldiers killed on battlefield after battlefield during the march across the Pacific.

### CONCLUSIONS

The influence which air power exerted upon the OKINAWA operation can only be partially evaluated in terms of enemy planes shot down, weight of bombs dropped and close support missions executed. It is clear that air power was a key element in the team which achieved success on this, the first battle ground within the inner ring of the enemy's own Empire.

Certain lessons were learned and certain previously determined facts were reemphasized. Conclusions arising from the OKINAWA campaign in the matter of aircraft participation may be summarized as follows:

- (1) Bombardment aviation is most effective in attacking the enemy's means at their source. It is not effective in achieving complete destruction or even prolonged neutralization



of outlying bases so long as the enemy maintains the potential for restoring those bases.

- (2) The effectiveness of the strategic air effort, in the sense of horizontal bombing, is negligible in the destruction of materials which are well dispersed above ground, or are protected by underground storage.
- (3) Strategic air activities demonstrated an effectiveness in interrupting enemy shipping efforts and in destroying the logistic potential of sea ports.
- (4) Fighter aircraft are a vital element in the defense of beach-head operations. While the defensive ability of naval anti-aircraft cannon is unquestionably high, without defensive air cover, heavy, perhaps prohibitive losses may be expected.
- (5) The contributions rendered by close support aviation were the most significant air development of the operation and had a powerful effect on its outcome. The soundness of the Marine air-ground coordination technique was manifestly demonstrated.
- (6) The principle of unity of command in the theatre of operations was reemphasized. Further emphasis, however, was placed on the fact that the unity of command must be of such a nature as to coincide with the local circumstances as in the case of the Tactical Air Force, 10th Army, including both Marine and Army aircraft and under the command of a Marine.



- (7) The technique of parachute air delivery, as developed and practised by the Marine Corps, had far reaching tactical significance in maintenance of operational momentum.



# PART IV

A BRIEF SUMMARY OF OPERATIONS  
OF U. S. MARINE CORPS AIRCRAFT  
DURING THE WAR



## PART IV

### A BRIEF SUMMARY OF OPERATIONS OF U. S. MARINE CORPS

#### AVIATION DURING WORLD WAR II

#### INTRODUCTION

Marine Corps Aircraft were active in combat operations from the early days of December 1941, when Marine Squadrons took part in the heroic defense of WAKE Island, to the last hours of the war, when Marine air units participated in the paralyzing carrier strikes on Japan. During the interval between these two extremities the record of Marine Corps Aviation is one of rapid expansion coupled with concrete achievement.

While undergoing its extraordinarily swift expansion the Marine Corps air arm was actively engaged in every theatre of the Pacific War, rendering close support not only to Marines but to soldiers as well. As a matter of interest it is to be noted that the close support operations of Marine Corps aircraft in support of Army Troops in the Philippines exceeds in magnitude any similar operations performed by Marine planes for Marine ground forces, and is indeed one of the outstanding contributions of Marine Corps Aviation to the Pacific War.

Briefly summarized herein is the progress of the expansion of Marine Corps Aviation during the war as well as the offensive operations of Marine Corps aircraft against the enemy. Appendix 2 analyzes



the record of achievement in detail, and illustrates clearly the rise in power and effectiveness from December 1941 when 27 action sorties took place, to 1945 when 25,000 action sorties were flown in the Philippines alone, with many thousands more in other theatres of the Pacific War.

## SECTION I

### THE EXPANSION OF MARINE CORPS AVIATION

The figures listed below depict the rise in strength of Marine Corps Aviation units during the progress of the war.

(a)	Total Marine Corps squadrons 31 December, 1941.....	13
	(1) Overseas .....	7
	(2) Within Continental Limits.....	6
(b)	Total Marine Corps squadrons 31 December, 1942.....	40
	(1) Overseas.....	22
	(2) Within Continental Limits.....	18
(c)	Total Marine Corps squadrons 31 December, 1943.....	87
	(1) Overseas.....	38
	(2) Within Continental Limits.....	49
(d)	Total Marine Corps squadrons 31 December, 1944....	108
	(1) Overseas.....	68
	(2) Within Continental Limits.....	40
(e)	Percentage of Marine Corps Aviation personnel who served overseas during period of active operations.....	93.2%

## SECTION II

### SUMMARY OF ATTACK ON ENEMY GROUND AND SURFACE TARGETS

TARGET	MARINE AIRCRAFT ENGAGED	M. G. Amm (1000s)	CANNON (100s)	ROCKETS	BOMBS (Tons)
<u>AIRFIELDS</u> including grounded aircraft, hangars and other buildings, revetments, A/A, runways, air-field surfaces, gun positions.	15,751	3,712	963	10,345	7,715
<u>HARBOR AREAS</u> including docks, adjacent built-up areas, adjacent A/A, gun emplacements, defense installations.	21,594	4,463	344	2,428	9,407
<u>MILITARY INSTALLATIONS</u> other than those above, including personnel, bivouacs, storage facilities, ammunition dumps, oil tanks, supply areas.	55,202	15,605	2,689	18,721	26,725
<u>TRANSPORTATION FACILITIES</u> not included in above, including trackage, roads, bridges, vehicles, and other motive equipment.	4,404	1,476	295	936	1,562
<u>INDUSTRIAL</u> , manufacturing, and mining facilities.	160	105	10	243	47

## SECTION II

### SUMMARY OF ATTACKS ON ENEMY GROUND AND SURFACE TARGETS

Cont'd

TARGET	MARINE AIRCRAFT ENGAGED	M. G. Amm (1000s)	CANNON (100s)	ROCKETS	BOMBS (Tons)
LAND TARGETS, known and unknown; urban areas.	3,383	545	30	297	1,047
<u>ARMORED COMBAT- ANT SHIPS.</u>	288	3	0	0	67
<u>UNARMORED COM- BATANT SHIPS.</u>	651	94	0	450	132
<u>MERCHANT VESSELS</u> Auxiliary Ships over 500 tons.	1,130	246	11	999	353
<u>BARGES, LUGGERS;</u> noncombatant small craft 500 tons or less; unknown types.	3,836	831	246	983	497
TOTALS	106,399	27,080	4,588	35,402	47,552

HEADQUARTERS, USMC  
HISTORICAL SECTION  
RETURN TO

### SECTION III

#### SUMMARY OF OPERATIONS AGAINST ENEMY AIRCRAFT

TYPE OF AIRCRAFT	ACTION SORTIES FLOWN	OWN LOSSES					ENEMY LOSSES		
		A/A	A/C	Total Combat Losses	Opera- tional Losses	Grand Total	Air- Borne	On Ground	Total
Fighter	56,580	266	254	520	244	764	2,116	411	2,527
Bomber	43,583	101	19	120	88	208	28	4	32
Torpedo Bomber	7,892	54	11	65	23	88	15	1	16
Other Types	8,368	32	0	32	12	44	0	2	2
TOTAL	116,423	453	284	737	367	1,104	2,159	418	2,577

Ratio of enemy losses to own combat losses..... 3.6 to 1.



SECTION IV  
SUMMARY OF OPERATIONS OF MARINE CORPS AIRCRAFT BY  
GEOGRAPHICAL AREAS.

AREA	MARINE AIR- CRAFT ENGAGED	M. G. (1000s)	CANNON (100s)	ROCKETS	BOMBS (Tons)
Marshall Islands	17,700	3,665	1,456	1,268	7,434
Eastern Carolines	589	197	-	25	217
Western Carolines	11,098	1,049	192	851	2,851
Wake, Marcus	27	14	-	-	-
Celebes, Borneo	84	62	-	51	25
Ryukyus	6,500	2,624	2,479	25,862	2,369
Formosa	60	42	-	99	5
Central Pacific	49	-	-	-	-
South China	7	2	-	-	1
Indo-China	19	30	-	-	3
Eastern Japan	224	178	9	464	11
Central Japan	105	112	-	328	-
Western Japan	916	455	170	2,633	116

SECTION IV  
SUMMARY OF OPERATIONS OF MARINE CORPS AIRCRAFT BY  
GEOGRAPHICAL AREAS - Cont'd

AREA	MARINE AIR- CRAFT ENGAGED	M. G. (1000s)	CANNON (100s)	ROCKETS	BOMBS (Tons)
Korea, Man- churia, and North China	1	-	-	8	-
Central China	8	1	-	49	-
Solomons and Bismarcks	41,178	9,937	60	564	21,866
Marianas	1,788	456	61	180	280
Gilberts, Nauru	100	13	-	-	58
Bonins	248	110	-	1,282	41
Philippines	25,697	8,133	161	1,738	12,275
TOTALS	106,399	27,080	4,588	35,402	47,552

**THE EMPLOYMENT OF  
U. S. MARINE CORPS AVIATION  
IN CLOSE AIR SUPPORT**

**Appendix I  
to  
An Evaluation of Air Operations  
Affecting the U. S. Marine Corps  
During the War with Japan**



# THE EMPLOYMENT OF U. S. MARINE CORPS AVIATION IN CLOSE AIR SUPPORT

## FOREWORD

The purpose of this report is to provide a detailed exposition of the U. S. Marine Corps doctrine and technique for close air support.

Since the early days of inception, Marine Corps Aviation has had as its primary mission the provision of close support for Marine infantry landed by the Navy on a hostile shore. Close air support has been the subject of extensive investigation, development, and perfection under both peacetime and wartime conditions. From the abundance of its research, and the scholarship of its experience, Marine Aviation has come to a series of definite conclusions with respect to the employment of this effective weapon of aviation.

Because it is capable of providing either carrier or land based squadrons, Marine Aviation, implemented as it is by its specialized training and flexibility of organization, is uniquely adapted to provide close air support for its infantry.

Marine squadrons are particularly trained and



proficient in the intimate aspects of amphibious support from carrier bases. Land-based Marine squadrons, likewise, are exhaustively trained in all the features of close air support so that as soon as captured enemy airfields are available, they are able to provide a continuity of support that makes for an unbroken chain of assistance to the advancing infantry.

All Marines, both aviation and infantry personnel, have as a basis for their training an infantry indoctrination that is the essence of the Marine esprit. And, too, the unity of the Marine Command with both aviation and infantry under the Commandant of the Corps makes for a comprehensive control that is at once efficient and enviable.

The singular training given jointly to Marine pilots and infantry officers in the Marine Air-Infantry School personalizes the problems of aviation and infantry and generates a practical teamwork and practiced understanding of the coordination essential to close air support.

## I. INTRODUCTION

### A. TYPES OF AVIATION

The place of close support in the entire field of aviation may be better comprehended in a classification, by function, of all types of military aviation.

#### 1. Strategic Aviation

Strategic aviation consists largely of long-range bombing; the attack of enemy centers of production, his morale, his supplies, his communications, and the softening of areas for future attacks. It also pins down strategic reserves of troops or supplies which might be moved to any theater.

## 2. Tactical Aviation

Tactical aviation gains air supremacy, isolates a battle area, attacks enemy troops, transport, positions, and supplies throughout a battle area, and provides close air support. It includes:

### (a) Reconnaissance Aviation

Reconnaissance aviation is informative. Its function is to locate and analyze enemy strength and disposition, to observe, map, and photograph his activities, and territories, to observe, map, and photograph territories that we contemplate seizing, and to secure weather and hydrographic data.

### (b) Utility Aviation

Utility aviation moves men and supplies to battle areas, evacuates casualties, maintains communication services, drops propaganda leaflets, and sprays insecticides.

## B. CLOSE AIR SUPPORT

Close air support, is that type of tactical aviation which executes missions, either requested or approved by troop commanders, against enemy forces opposing the assault of our front line units..

Like artillery, it is a supporting weapon subject to the call of the ground forces.

Offensive warfare in the Pacific necessitated amphibious operations for the purpose of:

1. The seizure and occupation of island bases held by the enemy, or the establishment of bridgeheads in enemy-held land masses.
2. The conversion of these and contiguous positions to our use as bases for further offensive action against the enemy.

The necessity for the perfection developed in the technique of close air support arose essentially from the fact that, in the initial and critical stages of an amphibious operation, artillery support is lacking. However, means of supporting troops from the air have been so perfected and are so successful that they are now used, not only to take the place of artillery before it can be placed ashore, but also in coordination with artillery, after it is emplaced.

Success in amphibious warfare depends upon the closest possible cooperation and coordination between all arms involved.

In order for aviation to function effectively in the support of landing operations, it is important that there be an effective air command, under the direction of the Commander who is responsible for the conduct of the operation.

### C. DEFINITIONS

Some of the more important terms which will be used in the chapters to follow are defined herein:

#### 1. CLOSE AIR SUPPORT

Close Air Support is that type of tactical aviation which executes missions requested or approved by troop commanders against enemy forces opposing our front line units. In its narrowest sense the term close air support is defined as: ATTACK BY AIRCRAFT OF HOSTILE GROUND TARGETS WHICH ARE AT SUCH CLOSE RANGE TO FRIENDLY FRONT LINES AS TO REQUIRE DETAILED INTEGRATION OF EACH AIR MISSION WITH THE FIRE AND MOVEMENT OF THE GROUND FORCES IN ORDER TO INSURE SAFETY, PREVENT INTERFERENCE WITH OTHER ELEMENTS OF THE COMBINED ARMS AND PERMIT PROMPT EXPLOITATION OF THE SHOCK, CASUALTY AND NEUTRALIZATION EFFECT OF THE AIR ATTACK.

It does not include missions executed off the battlefield or at such range from the ground forces as to re-

quire no specific coordination of air and ground action beyond the general delineation of a zone in which air action is unrestricted.

## 2. CLOSE SUPPORT AIRCRAFT

Close support aircraft are aircraft which execute missions in attack of targets directly opposing the advance of front line troops, under conditions where the air attacks are controlled by front line forces on the ground. In an amphibious landing at a considerable distance from friendly bases, air support is normally supplied by carrier-based aircraft. In a shore-to-shore operation, or when bases are secured ashore, carrier-based aircraft are frequently replaced or supplemented by land-based aircraft.

## 3. COMMANDER AIR SUPPORT CONTROL UNIT

Commander Air Support Control Unit (ComASCU), acting under the Naval Attack Force Commander, has tactical control of all support aircraft at the objective, and exercises this control through his Air Support Control Unit (ASCU), composed largely of aviation and communication personnel trained to control and coordinate all phases of air support required for a landing on a hostile shore. ComASCU operates from aboard ship throughout an amphibious operation.



#### 4. LANDING FORCE AIR SUPPORT CONTROL UNIT

A Landing Force Air Support Control Unit (LanFor ASCU) is composed largely of aviation and communication personnel, specially trained to control and coordinate close air support of troops which have effected a landing on a hostile shore. Control of troop support missions are normally delegated to ComLanForASCU when Commander Landing Force assumes command ashore. The LanForASCU usually lands with and operates adjacent to Landing Force Headquarters. It normally acts under the Landing Force Commander in directing and controlling troop support aircraft.

#### 5. AIR COORDINATOR

The Air Coordinator is normally an especially trained Senior Aviator airborne at the objective, and acts as the airborne representative of ComASCU to coordinate, direct, and lead "dummy runs" and air strikes as directed by ComASCU. He also reports on the air and ground tactical situations, and is prepared to search out, identify and mark targets by use of strafing, smoke rockets, or smoke bombs, as directed by ComASCU.

## 6. AIR OBSERVER

Air Observers are flown in aircraft equipped with extensive communication facilities. They are infantry officers trained in the technique and tactics of ground warfare. Their function is to patrol the objective areas, searching out and spotting targets and the movements of own and enemy troops. All information obtained is passed by the Air Observers over their radio circuits to the appropriate ground commander in order that his ground intelligence may be supplemented by information gained from air observation. The Commander Air Support Control Unit also monitors these circuits, and has direct communication with the Air Observers. He is thereby enabled to use the information received for the purpose of planning support missions.

## 7. AIR LIAISON OFFICER

An Air Liaison Officer (ALO) is an aviation officer attached to ground forces and specially trained to provide liaison and communication between ground force units and supporting aviation units, normally through the medium of Commander Air Support Control Unit (ComASCU) or Commanding Officer Landing Force Air Support Control Unit (COLanForASCU). He also

advises his own Commanding Officer on all matters pertaining to the employment of support aircraft.

#### 8. AIR LIAISON PARTY

An Air Liaison Party (ALP) consists of an Air Liaison Officer and his enlisted personnel who operate radio and other communication equipment.

#### 9. AIR SUPPORT PLAN

The Air Support Plan of the Naval Attack Force Commander designates the aviation units which will furnish the aircraft for air support, the bases from which the aircraft will operate, the type and number of aircraft and armament available, flight schedules to be maintained, communication plan, and general air tactics to be followed.

#### 10. INITIAL POINT

An Initial Point is an orbit point where planes circle, waiting to be utilized on a strike mission.

### II. CONTROL OF SUPPORT AIRCRAFT

#### A. AIR SUPPORT CONTROL UNIT (AFLOAT)

##### 1. History

It was not until the beginning of this war that the Air Support Control Unit (ASCU) was employed. It was developed through necessity for centralized control and coordination of air support at the objective during

the assault landing and later during the exploitation of the beachhead.

During the amphibious stage of the operation, ASCU is located aboard the command ship of the Amphibious Force Commander. The Command Ship was formerly a battleship or some other combatant type. A battleship was employed at the landing in North Africa. The disadvantage which developed in this instance was that the Command Ship engaged in pursuit of an enemy vessel, and as a result the Landing Force Commander was absent from the landing operation. Another disadvantage was that the combatant type of vessel did not have adequate communication equipment and every time the ship fired its battery, the shock disturbed the frequency setting of all radios, thus rendering good communications impossible.

The need for a vessel having no duties other than that of transporting the high command and exercising control of an operation was a pressing reality. This need brought about the development of such a vessel - the AGC (Amphibious Force Flagship).

The AGC was first used in the Pacific in the Marshalls operation, and proved so satisfactory that it has been used on all subsequent operations.

The AGC is designed to carry the commanders of the various forces, and their staffs. It carries sufficient radio transmitters and receivers to cover all the frequencies required, as well as a number additional in a standby status.

The AGC's sole function is to provide the various commands with a fully equipped headquarters afloat. Since the control of air support is a command function, the ASCU is embarked in the AGC with the appropriate commander.

## 2. Functions

Experience has proven that effective air support requires positive and accurate control by an agency (ASCU) located in the objective area. The functions of this agency are:

- a. To make the most efficient use possible of every aircraft in the objective area by maintaining at all times complete and up-to-the-minute information on both the air and the ground situation, using this information in allocating aircraft to each of the many types of air support missions and to each of the various forces requiring air support.



b. To provide an integrated and efficient air defense for the troops and ships of the amphibious forces:

(1) Against enemy air attack, by assigning aircraft to Combat Air Patrol as necessary and coordinating the activities of the various Fighter Director Teams, afloat and ashore, in identifying enemy air raids and vectoring friendly fighter aircraft to intercept them.

(2) Against enemy submarine attack, by assigning aircraft for Anti-Submarine Patrol and coordinating the operations of the aircraft with those of surface craft ordered to operate with them on Hunter-Killer missions.

(3) Against enemy surface attack, by controlling the activities of all aircraft at the objective, and coordinating their operations with those of friendly surface forces.

c. To provide accurate air strikes close to the front lines, with the least possible delay after receipt of requests from ground forces, and to do this without unduly endangering friendly troops or aircraft. In order to accomplish these results, it is necessary to maintain air strike groups on

station over the objective area continuously during the hours of daylight when the weather permits; to give the pilots in the air last-minute briefing on the targets to be attacked, the types of strikes desired (strafing, bombing, rocket, Napalm, etc.), the direction and altitudes from which attacks are to be made, and front line positions.

d. To supply the latest intelligence to carrier and land-based air forces scheduled to execute pre-briefed strikes against targets deeper in enemy territory.

e. To control aircraft used for Air-Sea Rescue assigning missions to them as necessary, providing fighter cover when required, and coordinating their activities with those of surface craft and submarines assigned to Air-Sea Rescue duty.

f. To control all miscellaneous aircraft missions within the area, such as: smoke laying, photographic, insecticide spraying, air delivery of supplies, etc.

g. To control all air traffic in the objective area in order to protect aircraft from surprise enemy air attack, friendly anti-aircraft fire, and collisions

with other aircraft; to make possible immediate approaches and landings by damaged aircraft, particularly those with faulty or inoperative IFF; and to assist in early identification of enemy aircraft in the area.

These, then, are the general functions of the ASCU while it is afloat. In a subsequent section, the functions of the Landing Force Air Support Control Unit will be taken up and it will be shown in what respects its functions differ from those of ASCU while afloat.

### 3. General Organization

a. In order to provide effective control of air support at objective areas in amphibious operations, Air Support Control Units and Landing Force Air Support Control Units were created and organized as an element of the Amphibious Forces, under Commander Air Support Control Units, Amphibious Forces, U. S. Pacific Fleet, a senior aviator with rank of rear admiral. Headquarters for him and his staff was aboard the flagship of Commander Amphibious Forces, U. S. Pacific Fleet. Commander Air Support Control Units (short title, ComASCU, PhibsPac) was responsible for the organization,

administration, training and operations of Air Support Control Units (short title ASCU) and Landing Force Air Support Control Units (short title Lan-ForASCU), and had the additional duty of advising Commander Amphibious Forces on over-all plans pertaining to air support.

b. Air Support Control Units on board the flagships of Amphibious Force and Group Commanders consisted of approximately 18 officers and 56 men each, under the command of a Commander Air Support Control Unit (short title ComASCU ONE, TWO, etc.), an aviator of the rank of Captain or Colonel. Officer personnel included aviators, Air Combat Intelligence Officers, Communications Officers, Fighter Director Officers and other general and special service officers. Enlisted men in each unit included radiomen, radio technicians, clerks, and strikers for radio ratings. For purposes of planning, rehearsals and operations, Air Support Control Units were temporarily attached to the various Amphibious Forces, and Group Commanders, and were ordinarily embarked in their flagships.

c. The Tables of Organization called for the Chief of Staff of ComASCU to be an aviator with the rank of Brigadier General, who had additional duty as administrative commander of personnel on duty with Air Support Control Units and personnel on duty with Landing Force Air Support Control Units, under the title of Commanding Officer, Ground Air Support Control Units.

5. Communications Employed in the Close Support of Ground Operations.

The various nets used to carry out the control functions of ASCU Afloat are as follows:

a. Support Air Request (SAR)

This net is used for communications with Air Liaison Parties ashore. Normally there will be a separate SAR net for each area of responsibility assigned to an Attack Force Commander.

b. Support Air Direction (SAD)

(1) The Support Air Direction nets are used for communications with an direction of all aircraft reporting on station over the objective for troop support missions. Front line Air Liaison Parties and Air Coordinators will employ this net



for control of close support missions.

(2) Additional Support Air Direction nets are used for communications with, and direction of, aircraft reporting on station over the objective for miscellaneous missions including photographic, smoke, supply, pamphlet drops, insecticide spraying, message drops, and hydrographic reconnaissance.

c. Support Air Observation (SAO)

This net is used for communication with air observers.

d. Air Support Command (ASC)

This net is used for both operational and administrative traffic between Air Support Control Units and Carrier Task Forces, Groups, Units, and shore based Tactical Air Commands.

e. Air Control (AC)

This net is used for operational and administrative traffic between the Joint Expeditionary Force Air Support Control Unit and the Commanding Generals of land based Air Forces, Fighter Commands and Bomber Commands.

f. Inter-Commander Air Support (ICAS)

This net is used for communications between Air

Support Control Units. Tactical Control Centers may guard this net when they are set up ashore. Additional circuits are used for communications between Air Support Control Units and ground liaison officers established at airfields in the objective area. It also may be used between Air Support Control Units when distances allow, and security demands.

g. Air Sea Rescue (ASR)

This net is used for directing Air Sea Rescue aircraft and for reporting aircraft in distress. It is guarded by all rescue facilities available; i.e., surface ships, PT boats, VOS aircraft and lifeguard planes, seaplane bases, and lifeguard submarines.

h. Distress Guard

All planes guard this frequency and use it for reporting their positions when in distress. This net is also used for Air Sea Rescue communications and is guarded by all Air Support Control Units and other organizations equipped to do so.

i. Local Air Warning (LAW)

This net is used for all intra-force warnings of enemy aircraft, submarines, mines, and suicide

boat activities. All ships, air liaison parties, Fighter Director stations both afloat and ashore, Air Defense Control Centers and air bases ashore and radar pickets must guard this net when within a designated area of responsibility. In addition, all local area air raid and anti-aircraft control conditions are transmitted over this net.

j. General Warning (GW)

This net is used for inter-force and inter-area warnings between commanders of task forces or task groups. Expeditionary Force ships guard it enroute to, or departing from, the objective area.

k. Anti-Submarine Warfare (ASW)

This net is used for controlling aircraft on anti-submarine patrol and for communications between ships and aircraft conducting hunter-killer operations. Seaplane bases guard this net.

l. Fighter Director (FD)

This net is used by Fighter Director bases, afloat or ashore, for direction of the combat air patrol at the objective area. In case of emergency the SAD nets may be used for fighter direction purposes.

m. Inter-Fighter Director (IFD)

This net is used by fighter director units afloat or ashore, radar pickets, early air warning shore radar units, tactical control centers, and air defense centers for intra-force exchange of air raid information, instructions and conditions.

n. General Fighter Control (GFC)

This net is used by Force fighter directors for intra-force exchange of air raid information, instructions and conditions. Airborne radar pickets and barrier patrols may use this net to inform Force fighter directors of approaching enemy aircraft.

o. Itinerant-Reporting In and Out (I-RIO)

This net is used for communications with itinerant aircraft such as NATS, ATC, TAG, Troop Carriers and staff planes entering or leaving objective areas.

p. Tower

This net is used for communications between airfield tower control centers and aircraft desiring to land on airfields at the objective area.

q. Tactical Air Liaison (TAL)

This net is used for teletype communications

between Air Support Control Units and tactical control centers for operational and administrative traffic.

#### 6. DUTIES OF AIR SUPPORT CONTROL PERSONNEL

The general duties of the various officers and enlisted men attached to ASCU are:

a. Commander Air Support Control Unit is responsible for all operations of the unit and for advising his task force, group or unit commander on all matters connected with air support.

b. Aviators, other than ComASCU, act as:

(1) Support Air Directors, who communicate by radio with all aircraft in the area except those on combat air patrol, anti-submarine patrol, and air-sea rescue missions. They receive reports of the arrival of aircraft on station, direct air traffic, assign missions and targets, give the pilots necessary briefing and coaching, and finally receive reports on the results of the missions from Air Coordinators and flight leaders.

(2) Coordinators, who act as duty officers, in-



tegrating the work of all net control officers and keeping each informed of pertinent developments. The coordinators handle interior communications, by telephone or inter-communication system, with various departments of the ship and with the task force or group commander and his staff, consulting with ComASCU when necessary.

c. General and special service officers act as:

(1) Net Control Officers, who receive and transmit all communications over the radio nets to which they are assigned. The names of these nets, and the agencies guarding each, have been listed above. The net control officers for SAD nets are the support air directors.

(2) Filter Officers, whose function is to assemble all information received by the Air Support Control Units over all radio nets and from other sources, to evaluate and screen it, and to pass on the resulting intelligence to the Attack Force and Landing Force commanders via teletype, and to other Air Support Control Units via radio. One teletype screen is located

in view of all net control officers, in order to assist them in keeping advised of the general situation.

- d. Air Combat Intelligence Officers, in addition to their regular air intelligence function, maintain up-to-the-minute situation maps based on all information received, particularly as to the positions of friendly front lines, enemy anti-aircraft or other defenses, potential targets for air strikes, and other similar matters. They may also act as net control officers.
- e. Fighter Director Officers, under the supervision of the Force Fighter Director, assume control of aircraft reporting for combat air patrol, assigning stations to the various divisions of aircraft. Some of these planes are ordered to report, for direct control, to other fighter director teams, both ship and shore-based, while others remain under the direct control of the ASCU Fighter Director Team. When enemy aircraft appear on the radar plots, the Force Fighter Director designates them, either individually or in groups, as "raids," and assigns each raid to a fighter director team for interception. The Force Fighter

Director evaluates all reports of bogeys received from the radar interpreters on his ship and from other fighter director teams and radar air warning stations, and keeps the task force commander and all ASCU personnel fully advised as to the status of enemy air raids and combat air patrol aircraft. He recommends changes in anti-aircraft control conditions, when necessary to enable friendly aircraft to land or take off in the objective area. Fighter director officers also notify ASCU personnel when bogeys are identified as friendly aircraft with faulty or inoperative IFF, in order that appropriate notice of the situation may be given to surface and ground forces as well as to the aircraft, which are then brought in to land or ordered to return to their bases. Aircraft relieved from combat air patrol may be ordered by fighter director officers to report to the Support Air Director for assignment of other missions, when so requested by the Coordinators.

f. Communications Officers, supervise the work of the radio personnel, assuring the maintenance of all communications equipment in proper operating condition, and directing the setting up of new radio sets

and outlets when necessary. They also receive and file all incoming dispatches, routing them to the appropriate officers for action as required.

g. Radio men monitor all radio nets, typing a running log of all traffic in order to assist the net control officers, and in order to maintain permanent records.

h. Radio technicians do all necessary radio maintenance and installation work, checking all transmitters and receivers frequently to assure that they are kept on frequency.

i. Clerks do all typing of communications, correspondence, memoranda, reports, etc., and maintain all necessary files.

j. Strikers relieve the radio men on watch, as necessary, and at other times act as messengers between the various Air Support Control Unit operating positions, as well as to other offices on the ship.

## 7. EMPLOYMENT

The ASCU located on the AGC has charge of fighter direction and anti-submarine control for the task force as it moves toward the objective. Once at the objective,

the pre-landing bombardment and neutralization by air is controlled by ASCU. It provides and directs the air cover for the underwater demolitions teams, mine sweeping operations, and the fire support forces. It directs photographic missions of the objectives and distributes the printed photographs to the various commands concerned. Finally it directs the attack of the air forces on various enemy targets in accordance with priorities assigned.

During the landing operation, ASCU controls all the strikes prior to arrival of troops at the beaches, and later, during the advance of the troops inland, controls the prearranged strikes as well as the call strike missions. After the troops have landed and the Landing Force Commander has gone ashore, the Landing Force Air Support Control Unit will also move ashore. When its equipment is installed and tested, and when directed, it will assume control of close support missions.

In the planning of an operation, ASCUs are assigned by the Commander of the Amphibious Forces. Normally one team is assigned to a designated landing area, and has control of all the aircraft which support the assault in that area.



Because of the vulnerability of the AGC in which the ASCU is embarked, provisions are made for at least one standby team on another AGC. Sometimes there are as many as two standby teams on an operation. Their duty is to monitor all the nets and keep their commanders informed of the situation. They must be prepared to take over command of air support on a moment's notice, in case the controlling ASCU is put out of commission.

B. LANDING FORCE AIR SUPPORT CONTROL UNIT  
(LanForASCU)

1. History

During the operations in the Gilbert and Marshall Islands, control personnel were landed with sufficient radio equipment to establish a limited control center. However, because the operations were of short duration and the islands so small, this organization was not afforded the opportunity to perform any function other than monitoring the air support circuits. In the Marianas operations, control personnel were again landed with sufficient radio equipment to perform the control function. However, there was a reluctance on the part of ComASCU to surrender control to the shore installation

and consequently most of their activities were confined to monitoring the various nets, with only an occasional opportunity to control.

The Marianas operation showed very definitely that a shore-based control unit was needed. With the control organization ashore, it was possible to work more closely with the ground forces, and to appreciate their requirements more thoroughly than is possible in the case of a ship-based unit. There was also a demonstrated need for some agency on the ground to perform direct liaison work with land based aircraft and to control such units.

It was decided, when preparing for the Iwo Jima operation, to have a Landing Force Air Support Control Unit organized and trained as such. It was decided also that most of the personnel in the unit should have had previous combat experience.

The SAD controllers in the first LanForASCU were former combat pilots. The SAR control officers were former battalion air liaison officers each of whom had made several assault landings. With these experienced personnel handling the control of close air support, a more realistic performance was anticipated. They

knew the problems of the aviator in executing close support strikes, as well as the problems of the battalion air liaison officers in requesting strikes and marking targets.

The first LanForASCU went ashore on Iwo Jima, and capably handled the control of support aircraft. They proved the wisdom of establishing a support team ashore with the Commander of the Landing Force. As a result of this experience, it was planned that, in all future amphibious operations, a Landing Force Air Support Control Unit should accompany the Commander of the Landing Force ashore. This was done at Okinawa and functioned with considerable success.

## 2. Personnel

The personnel attached to LanForASCU normally consists of about 22 officers and approximately 70 enlisted personnel. The officer personnel have, in general, the same type of duties as the corresponding officers attached to ASCU (Afloat).

The enlisted personnel have, generally, the same type of duties as those attached to ASCU (Afloat) with the addition of telephone, motor transport, and general duty men.

LanForASCU is not required to man all the radio nets employed by the ASCU (Afloat). It is not charged with the security of the task force and, therefore, can eliminate many security nets from its operations. In consequence it can devote all its time to the primary task, that of controlling the aircraft which are operating in close support of the assault troops. Usually LanForASCU will man only the SAR, SAD, ASC, ICAS, SAO, and LAW nets. The traffic carried on these nets is identical with that carried on the nets of ASCU (Afloat).

Before an operation, it is imperative that the control units have ample time for training together, as a team, as well as with the various air liaison parties. This insures smooth procedure as well as maximum coordination at the objective.

#### 4. Equipment

The communication equipment employed by the LanForASCU provides two-way voice communication, for control of strike and other aircraft on missions in close support of ground troops. The communication equipment should be flexible in nature to meet the needs of the individual operations plan, and should be adaptable to the changing tactical situation ashore. It should be of

such construction as to withstand hard usage and be able to operate under unfavorable climatic and adverse terrain conditions.

It has been determined by past experience that, normally, the LanForASCU should have available sufficient and suitable equipment to establish two-way voice communication in at least seven and preferable eight radio circuits. In addition it should be equipped to monitor at least two additional circuits. It has likewise been found that emergency or standby equipment should be available in such quantity as to assure adequate guard of all operationally essential channels. The LanForASCU may be required to establish two or three Support Air Direction Nets, two Support Air Observation Nets, two Support Air Request Nets, and may be called upon to assume operational control on other nets not normally an assigned responsibility.

To satisfy the general requirements outlined above MK IV Mod I Navy Mobile Communication Units have been successfully used; assigned on the basis of one set per LanForASCU. The MK IV Mod I unit is well adapted to the particular functions desired. Control of the vans can be remoted to a special operations room



(tent). The arrangement of the control tables and relative positions of the net controller generally follow the layout in the Joint Operations Room of the AGC.

Following the Iwo Jima operation, it was recommended that each LanForASCU be provided with a duplicate set of MK IV Mod I vans.

Secondary equipment may be provided by vehicular mounted HF and VHF radio sets, which are useful in controlling special strikes from advanced Observation Posts.

## 5. Functions

The functions of the LanFor ASCU differ somewhat from those of the ASCU (Afloat). The principle functions of the LanFor ASCU are:

- a. To make the most efficient use possible of close support aircraft in the objective area by maintaining at all times complete information on both the air and ground situation, and employing this information in the intelligent allocation of aircraft to air support missions as required.
- b. To provide accurate air strikes in close proximity to the front lines with the least possible delay after receipt of request from front line

troops, and to do this without unduly endangering friendly troops and aircraft.

c. To give pilots, on the ground and in the air, complete and timely briefing on the targets to be attacked, the types of strikes desired, direction and altitudes from which these attacks are to be made, and the location of friendly front line positions.

d. To supply the latest intelligence to carrier and land based aircraft scheduled to make pre-briefed strikes against targets deep in the enemy territory.

e. To control all aircraft in the objective area in order to protect aircraft from surprise enemy air attack, friendly anti-aircraft fire, and collision with other aircraft and to facilitate emergency approaches and landings by damaged aircraft.

f. To control all miscellaneous aircraft missions within the area, including smokers, photographic planes, insecticide sprayers, and cargo drops.

g. To control the airfield, when there is no other specifically designated air base command ashore, and to operate it until such a time as the designated command lands.

## 6. Employment

It is essential that the personnel attached to LanForASCU while enroute to the target area and prior to going ashore act as relief officers for ASCU (Afloat) and keep themselves informed of the latest developments prior to disembarking. Thus, when they land, LanFor ASCU personnel possess the latest possible information in the progress of the operation up to the time of disembarkation. When the Commander Landing Force goes ashore with his headquarters, LanForASCU will accompany him, set up its equipment in close proximity to the Landing Force command post, and be prepared to take over control from ASCU (Afloat) on order. Physically located near the headquarters of the Landing Force Commander, the LanForASCU is able to obtain all current information on the progress of the operation, and consequently is well equipped to carry out the desires of the Landing Force Commander in the employment of support aircraft.

### C. WHEN SUPPORT AIRCRAFT ARE BASED SHORE

The LanForASCU which functions ashore during the more advanced stages of an amphibious operation must be prepared for the better coordination which can be developed when

the support planes are based at a nearby airfield instead of on carriers. The administrative channel of communications can be established over land wire and may be elaborated to include teletypes and other means of communication. Personnel from the air base and from LanFor ASCU can confer on all important or complex missions, and thus increase the probability of their success.

An exchange of liaison officers between ground and air units is an essential. Ground liaison officers should be attached to the air units in order to assist in briefing pilots, and they should be attached to LanForASCU to insure that it is completely informed on all phases of the ground situation. Likewise, operations officer of the supporting air unit should be attached to the LanForASCU to keep it informed concerning availability of planes, bombs, and special weapons.

Ground liaison officers selected should be well versed in the technique of briefing air combat crews and the characteristics of close air support.

### III. AIR LIAISON PARTIES

#### A. HISTORY AND DEVELOPMENT

The modern concept of air liaison parties had its inception with the Amphibious Corps, Atlantic Fleet, at Quantico, Virginia in the spring of 1942. Experimental development was

undertaken at that time by The First Marine Division. Later in the year, the Atlantic Corps was transferred to the West Coast of the United States, and became the Amphibious Corps, Pacific Fleet and continued the development of its concept of air support control in landing operations.

At Guadalcanal, close air support was employed to the full capability of the personnel and equipment at hand. While very elementary in comparison with subsequent Marine developments, it represented a large forward stride in the relationship between ground units and supporting aircraft. In his official report on the operation, General Vandegrift wrote:

“Both (bombardment and fighter) united to support the ground forces . . . . . in spite of poor air-ground communications . . . . . Steps were taken to improvise air liaison parties. These proved a distinct improvement but there remains a need for regular organized air-ground communication teams within infantry regiments.”

In October of 1942 the Amphibious Forces, Atlantic Fleet supported the landings in North Africa where naval aviators were sent ashore to act as air liaison officers. The experience gained in this landing further demonstrated the need for developing trained air liaison parties for future amphibious operations.



The Amphibious Corps Pacific Fleet organized and trained the air liaison parties which landed with Army troops on Attu Island in May, 1943. An ASCU also was organized and trained, and later controlled air support for the Attu operation from the USS PENNSYLVANIA. Although the Attu operation was conducted in the face of most adverse weather conditions which seriously limited close air support, those missions which were flown demonstrated conclusively the need for the attachment of air liaison parties to units as low as battalions.

In the meantime, the Amphibious Forces Atlantic Fleet had established an Air Liaison School at Camp Bradford, Norfolk, Virginia where Army, Navy, and Marine officers and men were trained. The first of these trained teams landed with the 45th Army Division in Sicily.

Air liaison parties which had been especially trained and equipped for the operation landed with the Third Marine Division at Bougainville and performed well in directing close support missions, although there remained a need for highly portable communication equipment.

Air liaison parties were attached to the Second Marine Division for the Gilberts operation and functioned satisfactorily. Despite the small area in which the forces had to work they provided effective front line control and direction for close support

missions.

In November, 1943, the Joint Assault Signal Company was conceived. It contained the thirteen air liaison parties considered necessary for a division. At first, it was decided to make the JASCO a corps unit, to be attached to a division preparing for an assault task. But after successful work of the First JASCO in the Marshalls with the Fourth Marine Division, it was more consonant with progressive training to make the JASCO an organic element of the Marine Division. This arrangement was used thereafter --- for Saipan, Guam, Tinian, Peleliu, Iwo Jima, and Okinawa.

## B. ORGANIZATION

### 1. General

For administrative purposes, the personnel of the thirteen air liaison parties of a Marine division comprise the Air Liaison section of an Assault Signal Company. The Assault Signal Company is an administrative control unit only, and contains other amphibious liaison and communications sections, namely, the Naval Gunfire Section and Shore Party Communication Section. Prior to embarkation for an operation, the three tactical sections, as such, disappear and small teams or parties are attached to battalion, regimental, or division headquarters. ALOs, normally, are designated as division, regimental, or

battalion air liaison officers on the basis of seniority.

## 2. Regimental and Battalion Parties

Each regimental and battalion air liaison party, normally, consists of one aviation officer and six enlisted communication personnel.

## 3. Division Party

The Division Air Liaison Party normally consists of two aviation officers and eight enlisted communication personnel.

# C. SIGNAL EQUIPMENT

## 1. Regimental and Battalion Parties

It is necessary that the regimental and battalion air liaison parties be furnished with radio communications for use on the Support Air Request net, for the Support Air Direction net and to monitor the Support Air Observation net.

Each air liaison party has been provided with a TBX portable HF radio set to meet the initial communication needs of the party. The additional radio requirements mentioned above have been met by providing each air liaison party in the regiment and battalion with the AN/VRC -1 radio jeep. This jeep has the SCR-193 for HF channels and the SCR-542 has fulfilled the necessary VHF requirements. The SCR-193 component replaces the TBX or similar equipment on the SAR net when the vehicle lands. The frequency

band of both the transmitter and received are comparatively greater than those of the TBX.

The SCR-542 component has fulfilled excellently the VHF requirement. To facilitate the monitoring of air support circuits, the Air Liaison Party is provided with an RBZ receiver. This set is very light and is usually carried in a canvas case slung over the shoulder. The antenna clamps on the helmet. The nature of air liaison party activities generally limits the use of wire facilities to a minimum. Each party is usually allotted field wire and reel units for wire laying, and EE-8-A field telephone sets. This enables the remoting of the radio equipment from its position to a favorable observation point for the Air Liaison Officer.

Although the equipment described herein, both for radio and wire, has been used successfully in combat; its employment for the Air Liaison Parties will be continued only until it can be replaced by technologically improved equipment.

## 2. Division Party.

The Division Air Liaison Party is provided with the same major items of wire and radio equipment as listed for the battalion and regiment. However, the MAQ radio set has been successfully used in place of the AN/VRC-1. The MAQ contains the same VHF radio equipment (SCR-542), but the HF transmitter(BC610-E) is far more powerful and is mounted in a half-track personnel

carrier with power-unit trailer. The Marine air liaison parties, which were attached to army divisions in the Philippine campaign used a 1-1/2 ton (4 x 4) with trailer equipment and SCR-299 radio set modified by adding the VHF equipment. This scheme provided the necessary communication facilities as well as mobility for operating under conditions of rapid movement. It is considered that the Division Air Liaison Party should be furnished, in addition to its regular equipment, an AN/VRC-1 or similar equipment, to provide additional radio facilities for reserve and emergency use, either for the Division party itself or lower echelon air liaison parties.

#### D. TRAINING

1. The air liaison officers and enlisted men should be trained in the following subjects:

- a. Doctrine of Close Air Support
- b. Identification and Capabilities of Aircraft: Weapons - technique of operation and effect.
- c. Map and Aerial Photograph Reading and Terrain Appreciation.
- d. Tactical Organization of Troop Units: Weapons - technique of operation and effect.
- e. Supporting Weapons: Artillery, Naval Gunfire, Tanks, Rockets; tactical employment, effect and



coordination

f. Communication Procedure - Radio Operation and Repair

g. Use and Maintenance of Air Liaison Party equipment

h. Methods of target designation and front line marking

2. Advanced training should include command post exercises and air support exercises, with aircraft employing live bombs and ammunition, in conjunction with troop maneuvers.

3. Air liaison parties should be available for training with the troop units to which they will be attached for combat as soon as the troops enter the Combined Training Phase.

#### E. FUNCTIONS AND DUTIES

##### 1. Prior To a Landing

Prior to a landing, each ALO should acquaint himself with the unit operation order and make a map and photographic study of the objective, paying particular attention to the tactical plan of his unit, its assigned landing beaches, and probable zones of action. He should be prepared to submit to his commander a summary of the pertinent air support plan for reproduction and distribution and briefing of staff and subordinate units. During embarkation and movement to the objective, the ALO is responsible

for his party and its further training, and for the correct loading of the radio equipment, its protection and maintenance, and its readiness for service on D-Day.

## 2. During a Landing

### a. Regimental and Battalion Parties

Each regimental and battalion party, (less one man) will normally go ashore in the same boat with the commanding officer of the unit to which it is attached, or in the same boat wave. The ALP carries its portable radio equipment and leaves one man with the vehicular radio in a free boat to land on call.

### b. Division Party

The Division ALP initially remains aboard the Division Headquarters ship, and (using shipboard radios when available) checks in on the SAR net on D-Day, prepared to request such missions from ComASCU as may be directed by the Division Commander. The Air Observer's description of the progress of the landing and the situation ashore is personally supervised on the SAO net by the Division Air Liaison Officer. It is highly desirable that the SAO of adjacent divisions and the SAD nets

be monitored also if equipment is available.

All important traffic on these nets is forwarded in frequent summaries to the Division Commander.

An advance party from the Division ALP normally led by the ALO goes ashore with, or prior to, the boat wave carrying the advance party of Division Headquarters. This party carries portable radio equipment. The vehicular radios with driver/operators are embarked in free boats to land on call. The balance continues to operate aboard ship with the Division Command Post. When the Command Post displaces ashore, the Air Officer and the balance of the Division ALP normally proceeds ashore in the same boat group with the Division Commander.

### 3. Ashore

#### a. Procedure at CP

Immediately upon landing, each ALO sets up his radio equipment and places himself available to his commanding officer. Immediate coordination must be initiated with the ARTY and NGF Liaison Officers.

#### b. Operation on Air Support Nets

It is the responsibility of the ALO to advise his unit commander of the availability of aircraft and make recommendations concerning their tactical employment

in the unit's zone of action. Utilizing the SAR net, the ALO shall prepare, forward, and coordinate all requests for air strikes originated by his commanding officer.

The air liaison party making a request should be informed as soon as the request is granted, and should establish communication on the SAD net with the air coordinator leading the strike.

Upon notice from ComASCU that a strike is completed, the requesting ALP (or ALP assigned to control) will advise Com ASCU at the earliest opportunity of the results of the strike.

The SAR net is a voice net and is primarily for traffic between Com ASCU and ALPs requesting, coordinating and adjusting close air support of infantry units. This net will not be used for intra-ALP traffic without permission of the net control station, ComASCU.

Higher echelon ALPs monitor the requests of lower echelons on SAR and currently inform unit commanders of all requests in their own and adjacent zones of action. Higher echelons may cancel or modify requests of lower echelons in the

same chain of command by notification to ComASCU on SAR. Unit headquarters not in the chain of command who consider a requested strike dangerous to their troops, or otherwise undesirable, may request ComASCU to cancel or modify. It is the responsibility of all echelons to monitor the SAR net. In the absence of transmissions concerning cancellation or modification, silence is construed as concurrence of all commands in the requested strike. The above rule also applies to correction of "dummy" and live runs by ALPs with observation of the target; only the ALP requesting the mission or assigned by higher echelon to observe and report shall comment on the accuracy of "dummy" or live runs, unless specifically called by ComASCU, or unless the run endangers their unit.

ALPs shall be prepared on order of ComASCU, in the event of "jamming" or radio failure, to shift to alternate communication channels as may be prescribed.

ALPs will advise com ASCU of important changes in their front lines, and will notify ComASCU, when practicable, if the ALP leaves the net to displace.



At the conclusion of each days operation, whenever practicable, lower echelon ALPs will report deep support air targets which may logically be anticipated as the operation continues. Such targets will be in addition to, and distinguished from, those close support missions, or coordinated strikes, which may be requested for a planned advance, and will contain targets against which the Division can request strikes when aircraft with unexpended armament become available on short notice. Requests for PRE-KING Hour preparation strikes should be filtered by regiment and division, and passed to ComASCU via corps, by telephone whenever possible. Likewise, front line positions should be secured periodically during the day, and passed to ComASCU by Division ALP on SAR net, until LanForASCU is established ashore. Artillery will be notified of time and target area of air strikes, in order that land-based planes on artillery spot missions can be kept clear. Land-wire circuits should be used whenever possible, for better security and to reduce traffic on SAR net. When the vehicular radio becomes available to air liaison parties ashore, they will enter the SAD nets

and when directed by ComASCU the ALP will employ those SAD nets for controlling aircraft assigned to it. ALPs should also guard the SAO net, whenever practicable.

c. Special Functions and Duties of Division ALP

(1) Advance Party

The duties of the Advance Party of the Division ALP upon arriving at the Advance Message Center ashore are to keep Advance G-3 advised of important traffic heard on SAR and SAO, and to be prepared, on order, to assume the functions of Division ALP when the balance of Division ALP starts its ship-to-shore movement.

(2) Division Party

The Division ALP (assembled) ashore generally continues to perform the same functions as aboard ship and coordinate all air-ground activity within the Division zone of action.

The Division ALP maintains 24-hour listening watch on the SAR net. All requests for air strikes within, or adjacent to, division zone of action are reported to G-3. Any requested strike considered dangerous to a unit of the Division will

be reported immediately to G-3, and in an emergency, strikes will be delayed or cancelled by the Division ALO, and his action reported to G-3. Silence of Division ALP is construed by ComASCU as concurrence on strikes requested in Division zone of action. The Division ALO, as a member of the Division Target Information Center will maintain all pertinent air target data on the Target Information Map. Likewise, maintenance of a complete typewritten log of all transmissions on the SAR net is highly desirable if personnel and equipment are available. Division ALP will handle questions of relative priority of air support requests made by subordinate units through channels other than SAR net whenever possible. Operators should be particularly alert and prepared at all times to relay messages to ComASCU.

Division ALP normally exercises control of carrier based division air observers, and directs them on reconnaissance and observation missions. ComASCU continues to monitor SAO and may assume control in emergencies caused by weather or enemy action, or whenever it becomes necessary for the

aircraft to return to base. Regiments and Battalions may request observation missions subject to approval and net control of Division. Frequent summaries of important reports of the tactical observers will be sent to G-3 and will be integrated into the operations of the Target Information Center. Frequent position reports of air observers will be secured in order that rescue measures can be expedited in case of casualty. Air observers will be notified of impending air strikes in the division zone of action, and should be vectored as necessary in case of enemy air raids.

SAD (VHF or HF) nets will be monitored when strikes are being directed in the division zone of action and Division ALP should be prepared to transmit on these nets in emergencies on request of corps or ComASCU. The SAO net for adjacent divisions may require monitoring when major actions are occurring near division boundaries. It may also be necessary to monitor adjacent SAO nets in event of unavailability of the Division SAO because of jamming or loss of carrier based observation planes.

F. CONTROL OF AIR STRIKES BY AIR LIAISON OFFICERS.

The following paragraphs are included in this document for

the purpose of emphasizing the Marine concept of direction and control of close support strikes by air liaison officers.

#### 1. Large Scale Amphibious Operations

Infantry commanders are advised on the operation of supporting weapons, i.e., air, artillery, naval gunfire, rockets, by the appropriate liaison officer attached to the infantry unit requesting such support. The nature of the support and the method to be employed in coordinating and adjusting fires are dictated by the characteristics of the particular support weapon to be used.

The sum of experience in the Pacific Theater has indicated that under existing conditions the control of close support aircraft should be centralized at corps level by ComASCU or CoLanForASCU where it was coordinated with other supporting arms operating in the corps zone of action.

While the control of the SAR and SAD nets and of the aircraft involved rests finally with ComASCU or CoLanForASCU, the ALO, to whom a strike has been assigned for direction, will direct the aircraft on to the target unless countermanded by LanForASCU.

In spite of the limitations which, by the very nature



of aircraft in flight and the complexity of large operations, are imposed upon absolute control of air strikes by an ALO, it is still the concept of the Marine Corps that the direction of close support missions should be carried out by the ALO of the assault unit requesting the mission. This ALO has a far better knowledge of the situation on his own battalion front than ComASCU or CoLanForASCU can have, and he is, in addition, a Naval Aviator.

With the foregoing factors in mind, certain principles can be set forth concerning the control, direction and adjustment of close support air strikes by air liaison officers attached to infantry units in assault.

Whenever the following requirements are fulfilled LanForASCU normally directs the ALO requesting a strike to enter the SAD (VHF) and the ALO then directs the strike aircraft on to the designated target. LanForASCU, meanwhile, continues to monitor the SAD. The final decision as to whether such procedure may be followed rests with CoLanForASCU:

- a. The ALO shall request and receive permission via the SAR net to use the SAD net to direct a specified strike requested by him.

- b. The ALO shall have direct observation of the enemy target to be attacked and from a position far enough forward to enable him to recommend corrections for dummy or live runs.
- c. When directed by net control on SAR, he shall establish satisfactory radio contact on SAD with the Air Coordinator or Flight Leader (using remote control from radio jeep to forward observation post).
- d. His ALP shall continue to monitor the SAR net, prepared to transmit.
- e. The planes assigned to the mission shall be properly briefed by LanForASCU on the procedure to be followed, the target to be attacked, type and direction of attack and the general traffic pattern.

## 2. Small Operations

The foregoing discussion applies primarily to large scale amphibious operations where there is a LanForASCU operating with each Corps Headquarters. In smaller operations, when divisions or regiments are operating independently in mobile warfare an air support control organization will still operate with the command echelon. In some situations this might even be with a battalion headquarters. It is obvious that in such situations the ALO might operate with his HF/VHF radio jeep as

a complete control and direction unit for strike aircraft supporting the ground forces. ALOs have, on several occasions, directed strike aircraft on to targets from OY-1 (L-5) planes.

Marine Corps aviation units have successfully met all such types of problems while supporting Army division, brigade, and regimental operations in the Philippines. In some cases Marine ALPs were even attached to guerrilla regiments and operated for weeks behind Japanese lines, as mobile air support control and direction units.

#### IV. SUPPORT AIRCRAFT

##### A. INTRODUCTION

Close support aircraft have definite capabilities and limitations. The principle capabilities are high speed, excellent observation, long range, the destructive power of large quantities of high explosives and incendiaries in single increments or en masse, and the ability to reach areas defiladed from artillery or naval gunfire. The limitations of aircraft include limited endurance, limited ammunition capacity, limited ability to locate and attack pin point targets, restrictions imposed by weather and darkness, and occasional interference with the activities of other supporting arms.

##### B. WEAPON

1. The air units to be employed in close air support during the early stages of the operation will normally be drawn from

squadrons stationed aboard carriers. As the lines move inland and airfields are secured, land based squadrons will be flown in to operate from the captured fields, and to provide further close support.

2. The types of planes employed by both the carrier based squadrons and the shore based squadrons are divided into three types, namely: VF (and VFB), the fighter and fighter bomber; VB or dive bomber; and the VTB or torpedo bomber which is also employed as a light bomber.

3. In the VF (and VFB) type the following planes are currently in use:

a. The F4U series: -

MACHINE GUNS: Six forward firing 50 calibre machine guns, three in each wing, or four 20mm machine guns, two in each wing. Each fifty calibre machine gun carries 400 rounds of ammunition, a total of 2400 rounds. These rounds are belted in various fashions to utilize the combined effect of tracers, armor piercing, and incendiary bullets. The 20mm carries 200 rounds per gun, a total of 800 rounds.

ROCKETS: Also located on each wing are four rocket launchers, each capable of discharging rockets up to the 5" HVAR (high velocity aircraft rocket), a total of eight rockets per plane. The F4U-1D and the F4U-4, both of

which are fitted with one pylon at the stub of each wing, are capable of carrying one Tiny Tim (500# SAP bomb with rocket motor) on each pylon.

BOMBS: The early models are capable of carrying only one bomb of any size up to and including the 2000# type. The later models, the 1D and 4, are designed to carry three bombs up to and including the 2000# bomb, with a maximum load of 4000#. With the 4000# loading, one 2000# bomb is carried on the center line rack, and one 1000# bomb on each pylon rack. This load may be varied as desired, three 1000#, three 500#, or two 500# and one 1000#, the governing factor being sufficient take-off space. The center line and pylon racks are also capable of carrying the 325# or the 650# depth bomb.

NAPALM: The original models are capable of carrying one tank of napalm, containing 160 gallons. The later models with the pylon tanks, carry the center line tank of 160 gallons, plus one additional on each pylon of 150 gallons, making a total of three tanks, or 460 gallons of napalm.

b. The F6F: -

MACHINE GUNS: This plane is equipped with six fifty calibre machine guns, and has approximately the



same loading as the F4U. No F6Fs were produced with 20mm machine guns in the wings.

ROCKETS: The F6F is also fitted with four rocket launchers on each wing and is capable of carrying a total of eight rockets up to and including the 5'' HVAR. In addition to these rockets, the F6F may also be equipped to carry one Tiny Tim Rocket.

BOMBS: The F6F has two pylon bomb racks, each capable of carrying any bomb up to the 1000# bomb, or the 650# depth bomb.

NAPALM: The F6F is capable of carrying one tank of napalm containing 150 gallons.

c. The F7F: -

MACHINE GUNS: The early models of the F7F contained four fifty calibre machine guns in the nose, and two 20mm machine guns in each wing root. The later models exchanged the four 20mms for four additional fifty calibre machine guns.

BOMBS: It may carry a bomb up to an including a 2000# bomb under the fuselage and a wing rack on each wing capable of carrying as much as a 1600# bomb.

ROCKETS: The F7F is fitted with four rocket launchers under each wing, capable of carrying up to and including the 5'' HVAR.

NAPALM: It is equipped to carry one tank on each wing root with a capacity of 150 gallons and a center line tank of 300 gallons.

d. The F8F: -

MACHINE GUNS: The F8F has four forward firing 50 calibre machine guns of 300 rounds capacity each.

BOMBS: There are two racks each capable of carrying up to and including a 1000# bomb.

ROCKETS: Four rocket launchers are under each wing capable of firing a total of eight 5'' HVARs.

NAPALM: There are two wing tanks of 100 gallons each and a 150 gallon center line tank.

4. The current VB type is the SB2C dive bomber with the following load capacities:

MACHINE GUNS: Two forward firing 20mm machine guns and two 30 calibre machine guns firing aft.

BOMBS: A total of 2000# of bombs or depth charges is carried either as two 1000# or four 500# bombs.

ROCKETS: Four launchers under each wing, capable of carrying a total of eight rockets up to and including the 5'' HVAR.

5. In the VTB type there are at present two planes, the TBF

and the TBY, both very similar in their armament, which is:

MACHINE GUNS: Two forward firing 50 calibre wing-mounted machine guns. One 50 calibre machine gun in the rear turret, and one 30 calibre machine gun in the tunnel.

BOMBS: Both planes are capable of carrying a total of 2000# of bombs or depth charges. Such arrangements as two 1000#, four 500# or twelve 100# are frequent.

ROCKETS: These planes are also equipped to fire eight 5'' HVARs.

### C. PILOTS

1. Before pilots receive close air support training, they are qualified in all aircraft weapons and must be familiar with all types of attack used against ground targets. Their proficiency should range from accurate minimum altitude runs to seventy-degree dives, which are used in rocket, strafing, napalm, and bombing attacks.
2. Marine pilots, having completed the routine training syllabus outlined above, have previously been given additional training in the technique of providing close air support at various commands within the continental limits of the United States, as well as specialized joint training outside the continental limits. This training may be broken down into three well-defined phases:

a. PHASE I - Training at Marine Corps Air Stations within  
the United States.

(1) Special Flight Training

(a) Preliminary Flights - eight flights of one and one-half hours duration over a given target or impact area. These flights are composed of small groups of planes varying from four (4) to eight (8) of one type; i.e., 4 or 8 VMTB, or 40 or 8 VMBF, etc. Pilots do not carry live ammunition or bombs, but stress air support communications and radio discipline.

Target designation and map reading are emphasized. Problems are organized in which planes are given missions on targets of various types. Emphasis is placed on correct direction of attack, correct target location, and rigid flight discipline.

During the last two hours of this phase of training, live ammunition is used. Slow, highly accurate, and deliberate attacks are the keynotes of this phase. Timing is not stressed during this phase of the training.

(b) Joint Operations - twelve flights of one and one-half hours duration over target area. These exercises involve the utilization of squadron or squadrons to support a unit of the ground forces. Live bombs and am-

munition are used. These exercises also familiarize the pilots with the appearance of deployed ground troops, vehicles, field weapons, front line panels, colored smoke, and white phosphorous for marking targets. Air liaison parties are used in conjunction with these exercises.

(2) Ground School

(a) Introduction to Close Air Support (two hours) --

An introductory lecture and a film on air support to make the pilot cognizant of the material to be covered and what is to be expected of him.

(b) Pacific Grids and Target Location Problem (one and one-half hours) -- An explanation of the entire Pacific Grid System, its origins and uses as a coordinating factor of land, air, and sea forces followed by a problem in map reading employing air support charts and photo maps.

(c) Support Air Control Communications (one hour) - A review of the Commander Support Aircraft communication organization and emphasis of necessity for correct communications procedure in close air support operations. The function and organization of air liaison parties and detailed description of close support aircraft control nets, including stations and their types of radio traffic, are explained.



(d) Physiography (two hours) -- Basic land forms explained by contours, aerial photos and slides, followed by problems of identification using maps of both local and foreign areas.

(e) Briefing on Impact Areas (one hour) -- Briefing of pilots on the salient points of range safety, impact area procedure, communications, and conduct of problems.

(f) Logical Contouring (one hour) -- The principles of contouring illustrated by a fifteen minute film, followed by a question period and the actual contouring of an area by the students.

(g) Infantry and Front Lines (one and one-half hours)  
A lecture of general information for the pilot on the composition, formations, fire power, tactics, etc., of ground troops in order that he might more intelligently assist friendly troops in close support missions, constitutes the first half of this hour. The second half of the lecture acquaints the pilot with the methods currently in use for designating front lines. This lecture is supported by film strips showing the use of colored smoke grenades and colored panels.

(h) Target Location (two hours) -- Problems using maps, photos and worksheets to acquaint the student

with the difficulties of rapid target location, and amplified by the individual attention given to the questions of each student.

(i) Aircraft Codes (one-half hour) -- Explanation of the shackle code, its purpose and method of use, together with a description of call signs and when and how to use them.

(j) Naval Gunfire (one hour) -- The part that naval gunfire plays in supplying heavy fire power in support of the troops ashore is explained. Its characteristics, and its limitations are compared with those of air support.

(k) Air-Sea Rescue (one hour) -- A description of the responsibility of Commander Support Aircraft for air-sea rescue in the vicinity of the objective, and the methods used in effecting a rescue at sea in accordance with current doctrine.

(l) Signs and Symbols (one hour) -- Using a list of the more frequently employed signs and symbols of both the photo interpreter and the military map maker, the student is required to read the military situation as indicated on a problem map.

(m) Field Artillery and Tanks (one and one-half hours) General instruction to familiarize the pilot with the

characteristics, limitations, and capabilities of American field artillery. A second lecture explains the tactics, organization, and recognition of American and Japanese armored vehicles. This lecture is followed by a fifteen minute movie to acquaint the pilots with ground weapons and armored vehicles.

(n) Japanese Installations (one hour) -- A lecture stressing location and identification of typical close support targets with aerial photos and slides for demonstration.

(o) Photo Interpretation (two hours) -- Individual explanation and problems in the use of the stereoscope, and in identification and location of typical targets by means of aerial photographs.

b. Phase II - Joint Operation Training.

This phase of Marine pilot training consists of dress rehearsals with combined forces involving six (6) flights of one and one-half hours duration over a target area.

Emphasis is placed on a combined attack involving amphibious, ground, and air forces. Air groups provide combat air patrol, anti-submarine patrol, smoke planes, observation planes, beach strikes, "called" strikes, and prearranged strikes. During this phase, the difficulties of providing close air support, as well as the many other missions air must perform, are stressed.

C. Phase III - Rehearsals with Marine Infantry Units to be  
Supported in a Future Operation.

Prior to termination of the war, Marine pilots were also given additional training in close air support at OAHU and MAUI. During this phase, emphasis was placed on perfecting the system of close air support of the aviation unit and the infantry unit which was to be supported in a coming operation.

All elements to be utilized in providing close air support, such as the air liaison party, the control unit, and the aviation units involved, were accorded the opportunity to work out their common problems and to develop into a smooth functioning and well coordinated close air support team.

This joint training, however, was not performed at HAWAII alone. Similar training was conducted in the Southwest Pacific. There units of the First Marine Air Wing worked on joint rehearsals with Army divisions in order to acquaint the Army forces with the Marine system of close air support, which was employed subsequently in the Philippine campaign.

D. TACTICS

1. H-Hour Strike

Close support aviation is one of the most important weapons available to the attacking forces during the initial assault of the beach. It has been used on many operations in the following manner:



When the first boat wave is approximately 800 yards from the beach, and upon completion of the rocket attacks by LCI(R)s, aircraft begin strafing the beach, and continue such strafing until the first wave reaches the beach. This strafing, generally executed by a column of sections, is of the low angle type, so that the machine gun fire will be of a grazing nature.

When the first wave reaches a point 200 yards off-shore, the aircraft move their point of aim inland 200 yards, and continue strafing until two minutes after the troops hit the beach.

The support furnished by such aircraft is particularly important while the first wave is moving the last 300 yards to the beach. Naval gunfire has been lifted and it falls to the strafing aircraft to furnish the principal fire support required to neutralize enemy fire.

## 2. Troop Support

### a. Responsibility and Assumption of Risk.

The Battalion, Regimental or Division Commander, advised by his ALO of the hazard to his own troops in requesting a support mission close to his front lines, will balance that hazard against the probable casualties to his unit if it advances without close air support. The decision of a unit commander to request a close support mission includes the assumption of the risk involved. Normally, regimental and division headquarters will not cancel a mission because of proximity to front lines, if the risk involves only the battalion requesting such a mission.



b. Requesting Air Support.

(1) During the initial stages of a landing operation, carrier-based support aircraft normally will be required to be "On Station" (Air Alert) over an initial point to expedite the fulfilling of requests. The SAR net will be employed when requesting LanForASCU for support from aircraft "On Station". Even after the troops have effected a landing and secured a beachhead, support aircraft which are based ashore, normally continue to perform missions from the "On Station" state of readiness.

(2) During later stages of an operation, strike aircraft, as well as aircraft for special missions may be "On Call" (Ground Alert) at a captured airfield or "On Deck Alert" aboard a support carrier. Requests for air support from aircraft "On Call", may be made over the SAR net in the same manner as for aircraft "On Station".

(3) The source of planes for close support missions are:

(a) Support groups "On Station" with predetermined armament to be called in for close support missions by LanForASCU.

(b) Ex-VF from Combat Air Patrol (ex-CAP) consisting of VF planes completing a combat air patrol, which are called in so that they may expend their ammunition before returning to their carrier or field. Normally, LanForASCU should have a mission arranged for these planes which will consume only a short period of time. Such strikes are generally in close proximity to our front lines.

(c) Ex-VOF from Naval Gunfire Spot (ex-VOF) (Same as for ex-CAP above).

(d) Ex-Anti-submarine Patrol (Ex-ASP) planes are used on close support missions if not carrying special devices. Depth charges are excellent for close support missions, but again, due to limited remaining fuel, targets should be such that too much time will not be consumed in the execution of the mission.

(4) Reporting of Planes.

(a) All planes for close support missions report to LanFor-ASCU on the SAD net, or the SAD(E) in the event the former is being used to direct a strike.

(b) A flight leader is in command of the flight of each type of aircraft from each carrier or shore base. Flight leaders report the arrival and departure of their flights to the LanForASCU and the air coordinator over the SAD net, giving:

1. Flight leader's voice call.
2. Number and type of planes in flight.
3. Time available for use.
4. Armament.
5. Location (initial point) and altitude.

The flight leaders, with their planes, remain near designated initial points until they are required to attack on direction of LanForASCU or air coordinator, or in accordance with designated schedule. They direct the attack of their flight, and report

significant observations made by the flight.

(c) The Air Coordinator reports over the SAD net and is brought up to date on the tactical situation by the SAD net control officer. The air coordinator is normally on station over the objective area for a period of three hours. It is important that he confine himself to the coordinating of strike and troop support missions as directed by LanForASCU and not take over the flight leader's duty of directing flights in their attack. He also provides strike groups with pertinent information on the ground and air tactical situation and is prepared to search out, identify and mark targets by the use of strafing, smoke rockets, or smoke bombs.

(d) The reports of the flight leader and air coordinator are received by SAD net control officer at the LanForASCU.

Plane availability data is maintained on an availability board for a ready and accurate reference in assigning plane types and armament for close support missions.

(5) Mission Requests from Air Liaison Parties.

(a) Request Information.

Requests to LanForASCU on SAR net for close support missions will normally contain the following information:

1. Nature and description of the target (including nature of surrounding terrain; forward or reverse slope, etc.)
- 2- Location of target by reference to target grids, reference points, or photographs; also whether target is

to be marked with smoke.

3. Type and direction of attack.

4. Time and/or time limits of attack.

5. Pertinent information on coordination with artillery and naval gunfire.

6. Location of front lines (How marked; distance and direction from target.)

7. Observation (Direct or indirect)-

(b) Priorities.

Requests for close support shall contain the priority of the mission in the original call to LanForASCU according to the following definitions and examples:

1. Ordinary Targets:

a. Enemy targets of opportunity.

b. Enemy targets to be attacked in preparation for a planned advance at a pre-determined time.

c. Enemy targets which are delaying or holding up the advance of our troops but where fire is not immediately falling on friendly troops. Example of original voice call:

"LEHIGH -- THIS IS GAMMA -- TARGET -- OVER."

2. Priority Targets:

a. Enemy tanks or troops approaching our lines in such force as to threaten a breakthrough. (On SAIPAN, support planes responded to priority call from the ALO within two

minutes to drive back a counter-attack on the right flank of the landing beach about twenty (20) minutes after the troops reached the beach, and consequently saved a situation which might have jeopardized the entire 25th Regiment.)

b. Enemy artillery or mortars whose position is known and whose fire is falling on friendly troops. Example of original voice call: "LEHIGH -- THIS IS GAMMA --- PRIORITY TARGET -- OVER".

3. Search and Attack Missions.

(Same priority as "Priority Targets" after enemy source of fire is located.)

a. When the Air Liaison Officer does not have observation and cannot designate the location of guns which have fired on his unit, he must not use the word "target" in his call to LanForASCU, but shall request a "Search and Attack Mission" in the original call. Example of original voice call: "LEHIGH -- THIS IS GAMMA -- SEARCH AND ATTACK MISSION -- OVER".

b. As soon as LanForASCU acknowledges by saying "Send your mission" the Air Liaison Officer will give all information available, such as type of fire received, approximate enemy position or direction of fire, type of trajectory, frequency of rounds, and location of his own front lines.



Example of voice request: "LEHIGH THIS IS GAMMA:  
SEARCH AND ATTACK -- MEDIUM ARTILLERY --  
FLAT TRAJECTORY -- LOCATED SOMEWHERE NORTH  
OF AIRFIELD -- OUR FRONT LINES ARE IN TARGET  
AREA ONE SIX FIVE ABLE BAKER CHARLIE -- OVER"

(c) If projectiles from supporting aircraft are falling inside friendly front lines, air liaison officers may secure emergency clearance of the SAR net by use of the word "URGENT" repeated several times. The word "Urgent" normally shall not be used on the SAR net for any other purpose. Note: ALOs should forewarn troops that shell cases ejected from low-flying aircraft may sound like live rounds hitting in brush or trees.

(d) If an air liaison officer wishes to cancel a mission requested by himself or by the air liaison officer of a lower echelon, he may secure emergency clearance of the SAR net by use of the word "Cancellation" repeated several times.

(e) Upon hearing the words, "URGENT" or "CANCELLATION" the net control should clear the net for the urgent or cancellation message.

(6) Receipt of ALO Request at LanForASCU.

(a) Requests are received over the SAR net by the SAR net controller.

(b) Target information received is checked by air combat intelli-

gence officer for proximity to front lines, enemy AA fires, and best air route to target.

(c) Naval gunfire and artillery schedules are checked by the ACIO in order to determine whether their fires will endanger strike aircraft.

(d) If the target is safe for ground units and aircraft alike, the Commander Support Air considers the request, checks the availability of planes and approves. Commander Support Air orders the SAD net control officer to assign a particular flight to the mission. The SAD controller calls the flight, which is on station, informs them of the mission and refers them to the air coordinator who is designated to handle the strike. The Commander Support Air then briefs the Air Coordinator on the target. The strike planes assigned to the mission listen in on the SAD net and are briefed concurrently. Thereafter, and when necessary, the controlling ALP supplements the briefing.

(e) The ACI officer will inform the SAR controller that an ALO mission request has been approved and that planes will be over the target at the specified time. The SAR controller relays this information to the ALO who will inform his unit commander and prepare to assume control of the mission.

(f) While the attack is in progress the ALO may confirm after

each pass whether the run was true or he may request corrections on the basis of each point of impact. This information is transmitted on the SAD net direct to the flight leader concerned.

(7) Closing Out of The Mission

(a) Air coordinator will inform the SAD controller on completion of mission. The controller may or may not order the flight to return to base depending on the amount of ammunition and fuel they have expended.

(b) If naval gunfire and/or artillery has been lifted for the planes, their representatives are notified to resume fire.

(c) Damage analysis reports can be given by the ALO at once if SAR net traffic is light, but generally is not given until after sundown. The Air Coordinator immediately after the strike gives a damage analysis report to the SAD net controller.

c. Target Designation

(1) By Ground Forces

(a) Marking by white phosphorous (W. P.) mortar shells.

The front line ALO, after determining that marking is necessary and after insuring that mortars and W. P. ammunition are available, will include in his original request to LanForASCU the phrase "Can Mark With William Peter".

Upon being advised by LanForASCU that he requested

mission has been approved and assigned, the ALO will complete arrangements with the supporting mortar unit, including establishment of direct communications and subsequently securing a registration on or near the target, using HE mortar shells.

Communications will then generally follow the sequence below:

LanForASCU: "GEORGIA (Air Coordinator) WILL BE IN POSITION TO OBSERVE IN TWO MINUTES --- STANDBY TO MARK WITH WILLIAM PETER ----OVER."

ALP: "WILCO---OUT."

ALO alerts mortar section.

LanForASCU: "GEORGIA CAN OBSERVE ----MARK WITH WILLIAM PETER --- OVER."

ALP: "WILCO OUT."

Then ALO requests mortar section to fire smoke shell.

This procedure may be repeated until air coordinator locates target and leads in strike. In moderate or high winds, remarking is frequently necessary and when dust and smoke obscure the target area, or other W.P. shells are bursting in the vicinity, the ALO may recommend and arrange to mark the target with three or more W.P. shells fired in rapid succession.

#### (b) Marking by Artillery

When no mortar unit is available to mark a target, the battalion ALO should make similar arrangements through the

artillery liaison officer for marking by artillery.

(2) By Aircraft

The Air Coordinator and the Air Observer frequently designate targets to strike aircraft by making runs on the target using strafing fire, smoke bombs or smoke rockets. These marking runs usually can be observed by the ALO who notifies the strike group and LanForASCU on the SAD net of the accuracy of the runs.

(3) White phosphorous, whether mortar or artillery, or rocket marking by the Air Coordinator have some disadvantages. On the battlefield there is frequently a profusion of white smoke from various causes so that even accurate use of white phosphorous as a target marker loses some of its effectiveness. Whenever possible, colored smoke of an easy distinguishable color should be used for target marking.

(4) Briefing of Pilots

The best results on target designation can be obtained when pilots are briefed prior to take-off, (an impossibility when aircraft are carrier based). In an operation using land based squadrons where the airfield is likely to be near the LanForASCU and front lines, pre-strike briefing is practical. A member of LanForASCU with photographs and instructions should brief the pilots. The services of a ground officer



familiar with the terrain and target area in the strike leader's plane is of great assistance in target designation.

d. Front Line Marking

(1) Panels

Front lines have normally been marked by colored fluorescent panels, two of which are displayed by each assault squad upon instruction to mark lines.

(2) Smoke

When panels are not available or not visible to aircraft because of foliage or terrain background, front lines may be marked by colored smoke grenades.

(3) Coordination

Marking of front lines, particularly in the case of marking with smoke, should be carefully coordinated with aircraft in a manner similar to the marking of targets. ALO will make necessary advance arrangements with unit commanders to insure, in so far as possible, that marking of front lines is promptly accomplished when required.

E. EMPLOYMENT OF ARMAMENT

1. General

In considering the part to be played by carrier aircraft, it should be remembered that the weapons they carry range from the 50 caliber machine gun to the 2000-pound bomb, and

may include such special weapons as the airborne rocket and Napalm bomb. Consequently, aircraft can be equipped for attacks on any type target, but normally the planes arrive at the initial point pre-armed, and special armament requires advance notice.

## 2. Bombs

### a. General

In considering the proper armament for the given air bombardment, it is almost always necessary to compromise between the bomb which is large enough to do the job if it hits, and a smaller bomb which may be delivered in greater quantities, to increase the probability of a hit. Similarly, a compromise must be made between a fuze which will permit penetration and consequent destruction if a direct hit is made, and a fuze which will not permit enough penetration to smother both fragmentation and blast effect completely if the bomb is a near miss. To use precisely the correct bomb and fuze for a given type of target will be correct procedure only if it can be guaranteed that the bomb will make a direct hit. In the usual case, the bomb loading plan will necessarily be based on the assumption of attaining only fair accuracy.

In close air support, the 500 pound bomb should be selected for most bombing purposes against defended positions where troops will not be found in the open, because this bomb best meets the requirements of both size and quantity. 100 pound bombs are generally of limited effectiveness. They can be used to advantage for anti-personnel purposes, and occasionally for very close support missions in which their use provides a larger margin of safety for friendly troops. Due to weight and space requirements for racks for 100 pound bombs, their use on some types of aircraft reduces the total payload which can be carried.

b. Fuzing

Correct fuzing of bombs is most important in obtaining maximum effectiveness. The fuzes will vary according to the size and type of bomb, target or objective. As a general guide, for area bombing such as precedes the initial landing, an instantaneous or .025 fuze is desirable. For penetrating heavily-constructed strong points, a delay fuze together with a semi-armor piercing bomb will be most effective. In low level or skip bombing attacks against such objectives as caves, a four-second or longer delay fuze must be used to pro-

tect the aircraft releasing the bomb. The newly developed VT fuze is most effective against enemy personnel in open emplacements or above ground. Unless bombs are fuzed for a specific mission, it is always advisable to employ an instantaneous nose fuze and a delayed action tail fuze with selective arming. When the target is finally known, the most effective fuze should be selected. No hard and fast rules can be laid down regarding the fuzing of bombs.

#### c. Safety Limits for Friendly Troops

(1) The four factors governing the dropping of bombs in close proximity to our own troops are:

- (a) Pilot error in dropping.
- (b) Type, size and fuzing of bomb.
- (c) Type of protection afforded friendly troops.
- (d) Casualty risk which ground troops will accept.

(2) Pilot error may be minimized by:

- (a) Carefully marking aiming point.
- (b) Carefully marking front lines.
- (c) Dummy runs.
- (d) Runs parallel to front lines.
- (e) Reducing altitude and speed of drop.

(3) The casualties that a troop commander is willing

to accept for very close air support obviously depends on the tactical situation and disposition of the ground troops. The ALO should be cognizant of the probable errors and the lethal radius of the bombs before calling for such missions, and should advise the commander in all of those factors.

(4) Summary of Steps which ALO should follow in Determining Risk To Own Troops.

- (a) Determine the probable error to find where bombs will fall.
- (b) Determine lethal radius of bombs.
- (c) Add safety distance from bomb fall pattern to lethal range of bomb.
- (d) Result is distance in feet to nearest safe aiming point from friendly front lines.

### 3. ROCKETS

a. The 11-3/4" rocket, "Tiny Tim," is the first major caliber projectile to be carried by and fired from an airplane. The pay load of the rocket is a 500# semi-armor piercing bomb. The rocket is shot forward from the airplane at a velocity of 875 feet per second faster than the speed of the plane. The complete rocket weighs 1250 pounds.



b. The 5'' HVAR rocket is launched at a velocity of 1375 feet per second plus the speed of the plane. When all the eight rockets from one plane are fired simultaneously, the plane has a fire power equal to a destroyer's salvo. The enemy's ships, pillboxes, ammo dumps, transports, armored vehicles, AA positions -- in fact anything that would make a good target for a cannon -- can be considered a good target for rockets.

#### 4. Machine Guns

Strafing with machine guns is most effective against motor transport, troops and material in the open or in shallow trenches, and will at least temporarily neutralize open mortar, artillery, and anti-aircraft positions. Strafing also tends to hold the enemy away from their firing positions as our troops advance. Dummy runs, as assaults continue, frequently will pin the enemy down as long as the runs continue.

#### 4. Napalm

Gasoline mixed with Napalm is an efficient burning agent, and starts fires which are difficult to extinguish. The burned out area is about 90 ft. wide and 150 ft. long for each large tank. Napalm is used very effectively against personnel who are defending the ruins of buildings and fortifications, or who are occupying other semi-exposed positions. If used in quantity,

it will ignite scrub growth and destroy enemy camouflage, exposing enemy installations and driving personnel into the open. Napalm bombs can be dropped closer to friendly troops than general purpose bombs, since fragments or fluid normally are not thrown over fifty yards from point of impact.

#### 6. Smoke

Aircraft equipped with smoke tanks, although of a great value in blinding the enemy and screening friendly movements, should be used with caution. A slight error in the smoke run, in estimating wind direction or a small change in the direction of the wind, may accomplish an opposite result to the one desired. Aircraft equipped with smoke bombs may be used more freely, since a ladder of bombs laid on an enemy position will blind his troops for a short time, and yet the volume of smoke used is so small that, even if laid upwind, it usually disintegrates before reaching friendly lines.

#### F. TYPES OF ATTACK

The four types of attacks employed in close air support are the bombing attack, the rocket attack, the strafing attack and the Napalm attack.

##### 1. Bombing Attack

There are three types of runs by means of which bombing attacks are delivered.

##### a. First, the Dive Bombing Attack which is defined

as an attack undertaken from a high angle dive usually  $60^{\circ}$  to  $70^{\circ}$ , braked by flaps to maintain a constant medium speed during the latter part of the attack. The best plane to execute this type of attack is the designed dive bomber, as it is provided with an excellent dive brake to maintain its speed in these low limits, allowing for easy corrections in the steep dive. The VF have proven their worth as dive bombers, and their accuracy is approaching that of dive bombers.

In any dive bombing attack, the planes will stand by at an altitude not lower than that from which the dive is to be initiated. This altitude should be 7000 feet or higher. At this altitude the pilot has sufficient time to select the target, steady down his angle of descent, and take into consideration the other variables necessary to obtain a hit. The altitude of release will vary with the pilot. However, a dive bomber will usually make his drop from an altitude of 1500 to 1000 feet.

The speed of execution of a dive bombing attack will depend to a large extent on the amount of AA fire. If there is negligible AA fire, it is best, insofar as accuracy is concerned, to take a long interval between planes. In so doing a pilot can leisurely set himself up

in a perfect dive and will not be bothered by the proximity of other planes or by debris of previous bombs as they explode.

b. The second type of run, employed in dive bombing attack is known as glide bombing and is defined as a high speed attack delivered with accelerated motion at angles of  $30^{\circ}$  to  $55^{\circ}$  without the use of dive brakes, flaps or other speed-retarding devices. Glide bombing is accurate but still not in a class with dive bombing for actual pin-pointing of targets. Glide bombing is a high speed maneuver designed to capitalize on the element of surprise. The  $50^{\circ}$  angle of attack and the built up speed tender the plane a difficult target going in, and the excess speed after bombs away assists in retirement from range of the enemy AA fire. A plane in a dive bombing run is less vulnerable than one glide bombing, but the glide bombing run has the advantage when retiring.

c. The third type of bombing run that may be used to deliver a bombing attack is the low-level run and is defined as an attack delivered in a shallow glide of around  $20^{\circ}$  at extremely low altitude and short range. The approach may or may not be made from a steep

dive or glide. This attack may be used on those targets which present high angular or vertical faces to the flight path of the bomb. This includes such objects as block houses, and caves in the sides of vertical cliffs. With this type of attack it is possible to direct the bomb against these angular walls and obtain a maximum penetration. It would be difficult to hit the vertical mouth of a cave in a glide or dive bombing attack, but with the low level technique it can be readily accomplished.

## 2. Rocket Attack

Rocket attacks have been standardized into three classes, Class "A" comprising a  $20^{\circ}$  dive, Class "B" a  $30^{\circ}$  dive and Class "C" a  $50^{\circ}$  dive. With these three standard dives any type target may be successfully attacked.

## 3. Strafing Attack

There are two methods of delivering a strafing attack; the flat or small angle run, and the steep or high angle run. The flat run may be initiated at any altitude depending upon the speed desired. Its name is derived from the point of opening fire which is reached at a low altitude while the plane is at a low angle to the horizontal. In this type of run the pilot cannot hold his fire on any one object for a protracted period, but may cover and keep under fire a long strip of ground, at the



same time obtaining the maximum effect from ricochets. This is commonly termed area-strafting, and is directed at uncovered personnel and scattered material.

In the steep run the desired firing run is reached at a steep angle to the horizontal and allows the pilot to direct his fire for a period of time against the same pin point target until he is forced to pull out due to the close proximity of the plane to the ground. Frequently, if targets are available, a steep run will terminate in a low angle attack as the plane nears the ground at a low angle to the horizontal.

Strafting is employed not only as an attack in itself but is frequently used during bombing attacks to destroy exposed personnel.

A continuous neutralization may be established on enemy troops by strafting while our lines advance. The direction of the run is parallel to our advancing troops and the low level technique is utilized to obtain grazing fire and maintain fire over a large area. The steep run may be employed when a specific target is designated.

#### 4. Napalm Attack

A Napalm Attack is delivered by means of the same runs as utilized in delivering a bombing attack, the low level being the most frequently employed.

## G. TYPES OF MISSIONS

### 1. Preparation Fire For a Planned Attack

Close support aviation when used in conjunction with other support weapons to prepare the way for an infantry advance should fulfill the following requisites:

- a. A sufficient number of planes should be provided to insure complete and continuous coverage of the zone of advance.
- b. There should be a proper combination of planes to fulfill the need for large bomb loads, rocket and Napalm attacks, as well as accurate and concentrated strafing power.
- c. Smoke planes should be available to screen the advance of friendly troops if desired.

### 2. Attacking a Pin-Point Target In Close Proximity To Friendly Front Lines.

a. Aviation when used to destroy or neutralize a pin-point target which is holding up the advance of our infantry units should be utilized in the following manner:

- (1) Small supporting groups of six to nine planes are most satisfactory since they are easy to control and are sufficient to destroy most ground targets.
- (2) Flight leader or air coordinator employing

“dummy” runs should be used to insure positive target identification as well as proper direction of run.

(3) Planes should use delay action fuses in order to execute low-level attacks and thus increase accuracy.

(4) Pilots should be completely cognizant of the relation of target to front lines and should not fire unless target is positively identified.

### 3. Search and Attack Missions

Aviation can be used effectively for searching out targets which can not be discovered from the ground. Such type targets might be enemy artillery pieces delivering fire into friendly troops from an unknown position, enemy mortar positions on reverse slopes, or enemy units in motion but with their exact position unknown.



A STATISTICAL ANALYSIS  
OF  
OPERATIONS OF U.S. MARINE CORPS  
AIRCRAFT DURING THE WAR  
WITH JAPAN

Appendix 2  
to  
An Evaluation of Air Operations Affecting  
the U. S. Marine Corps During  
the War with Japan





## APPENDIX 2

### A STATISTICAL ANALYSIS OF U. S. MARINE CORPS AIR OPERATIONS DURING WORLD WAR II

#### INTRODUCTION

In the sections to follow the statistics surrounding operations of Marine Corps aircraft in the Pacific war are tabulated and analyzed. An examination is made of operations against enemy ground and sea targets, as well as against enemy aircraft, and finally a statistical exploration is made of the part played by Marine Corps aircraft in each geographical area of the Pacific conflict.

The figures included herein are derived from unit combat reports. During the early months of the war such reports were frequently not submitted, or were submitted in incomplete form. Consequently it is highly probable that occasional offensive air activities of the early part of the war, particularly in the SOLOMONS, have gone unrecorded.

# SECTION I

## ANALYSIS OF OFFENSIVE OPERATIONS OF MARINE CORPS AIRCRAFT

### AGAINST ENEMY GROUND AND SEA TARGETS

#### TARGET TYPE I

AIRFIELDS, including grounded aircraft, hangars and other buildings, revetments, A/A, runways, air-field surfaces, and gun positions.

PERIOD Year Month		Marine Aircraft Engaged.	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1942	Sept.	2	1	-	-	-
	Oct.	5	1	-	-	2
	Nov.	-	-	-	-	-
	Dec.	72	-	-	-	6
1943	Jan.	41	-	-	-	9
	Feb.	234	-	-	-	35
	Mar.	65	-	-	-	25
	Apr.	62	-	-	-	28
	May	17	-	-	-	8
	June	187	-	-	-	40
	July	184	-	-	-	98
	Aug.	193	5	-	-	97
	Sept.	415	37	-	-	242
	Oct.	504	140	-	-	303
	Nov.	731	216	-	-	511
	Dec.	312	91	-	-	192
1944	Jan.	150	24	-	-	92
	Feb.	323	48	-	24	188
	Mar.	570	40	-	-	258
	Apr.	132	127	-	24	374

TARGET TYPE I - Cont'd

PERIOD		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
Year	Month					
1944	May	541	155	-	-	260
	June	425	29	-	-	50
	July	281	33	-	-	62
	Aug.	262	61	-	-	56
	Sept.	246	35	-	-	170
	Oct.	323	231	-	-	106
	Nov.	820	168	-	32	287
	Dec.	1,038	174	-	48	747
1945	Jan.	1,058	230	-	-	510
	Feb.	1,199	405.	-	293	714
	Mar.	1,025	378	-	1,512	241
	Apr.	977	272	4	755	625
	May	887	116	7	1,874	566
	June	1,433	441	556	3,751	477
	July	839	193	396	1,698	336
	Aug.	188	61	-	334	-
TOTALS		15,751	3,712	963	10,345	7,715

## TARGET TYPE II

HARBOR AREAS, including docks, waterfronts, adjacent built-up areas, adjacent A/A, gun emplacements, and defense installations.

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1942	Sept.	14	-	-	-	-
	Oct.	14	-	-	-	-
	Nov.	22	-	-	-	-
	Dec.	16	-	-	-	1
1943	Jan.	12	-	-	-	-
	Feb.	-	-	-	-	-
	Mar.	-	-	-	-	-
	Apr.	4	-	-	-	4
	May	13	-	-	-	-
	June	-	-	-	-	-
	July	70	-	-	-	33
	Aug.	64	-	-	-	17
	Sept.	41	8	-	-	22
	Oct.	56	10	-	-	25
	Nov.	13	-	-	-	-
	Dec.	120	-	-	-	112
1944	Jan.	327	65	-	-	191
	Feb.	455	37	-	8	260
	Mar.	1,675	115	-	94	916
	Apr.	1,694	402	-	4	769
	May	1,482	652	-	48	569
	June	1,801	504	-	-	658
	July	2,869	903	-	-	1,072



TARGET TYPE II - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Aug.	3,249	370	-	-	1,407
	Sept.	1,287	227	-	-	562
	Oct.	1,867	211	-	-	830
	Nov.	1,351	153	-	22	601
	Dec.	765	77	-	-	386
1945	Jan.	549	93	31	250	291
	Feb.	455	146	-	237	168
	Mar.	410	127	-	371	135
	Apr.	200	106	-	140	96
	May	171	55	28	157	92
	June	228	49	198	661	80
	July	282	140	60	311	110
	Aug.	18	13	27	125	1
TOTALS		21,594	4,463	344	2,428	9,407

### TARGET TYPE III

MILITARY INSTALLATIONS including personnel, bivouacs, storage facilities, ammunition dumps, oil tanks, and supply areas.

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1942	Sept.	28	-	-	-	4
	Oct.	47	-	-	-	11
	Nov.	-	-	-	-	-
	Dec.	112	-	-	-	13
1943	Jan.	115	-	-	-	2
	Feb.	15	-	-	-	-
	Mar.	32	-	-	-	15
	Apr.	65	-	-	-	26
	May	30	-	-	-	-
	June	8	-	-	-	8
	July	407	-	-	-	224
	Aug.	342	19	-	-	152
	Sept.	329	32	-	-	196
	Oct.	284	60	-	-	107
	Nov.	634	239	-	-	343
	Dec.	1,242	333	-	-	749
1944	Jan.	140	81	-	-	79
	Feb.	317	36	-	72	183
	Mar.	822	97	-	-	499
	Apr.	565	89	-	-	253
	May	1,140	379	-	-	434
	June	516	158	-	-	160

TARGET TYPE III - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	July	1,106	352	-	-	489
	Aug.	2,651	574	-	-	1,022
	Sept.	3,735	1,293	-	-	1,390
	Oct.	3,348	1,456	20	-	1,296
	Nov.	3,528	1,321	-	142	1,398
	Dec.	1,457	371	-	24	678
1945	Jan.	911	225	3	69	499
	Feb.	5,012	1,522	-	628	2,297
	Mar.	6,509	1,700	-	1,102	2,932
	Apr.	6,015	2,121	74	3,967	3,105
	May	5,877	1,689	605	5,690	3,503
	June	4,199	768	1,313	4,368	2,385
	July	2,910	547	513	2,050	1,861
	Aug.	754	143	161	609	412
TOTALS		55,202	15,605	2,689	18,721	26,725

# TARGET TYPE IV

TRANSPORTATION FACILITIES including trackage,  
roads, bridges, vehicles, and other motive equipment.

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1942	Nov.	3	--	--	--	--
	Dec.	6	--	--	--	--
1943	Jan.	20	--	--	--	2
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	--	--	--	--	--
	Aug.	--	--	--	--	--
	Sept.	--	--	--	--	--
	Oct.	--	--	--	--	--
	Nov.	--	--	--	--	--
	Dec.	24	6	--	--	14
1944	Jan.	52	7	--	--	22
	Feb.	--	--	--	--	--
	Mar.	20	4	--	--	7
	Apr.	8	--	--	--	--
	May	--	--	--	--	--
	June	16	50	--	--	--
	July	213	95	--	--	105

TARGET TYPE IV - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Aug.	302	44	--	--	102
	Sept.	376	106	--	--	118
	Oct.	302	133	40	--	84
	Nov.	270	129	--	--	67
	Dec.	146	68	--	--	43
1945	Jan.	499	204	5	--	144
	Feb.	663	151	--	24	262
	Mar.	462	148	--	96	199
	Apr.	387	219	64	321	117
	May	288	59	36	353	89
	June	202	34	12	70	125
	July	126	19	126	72	49
	Aug.	19	--	12	--	13
TOTAL		4,404	1,476	295	936	1,562



# TARGET TYPE V

## INDUSTRIAL, MANUFACTURING, AND MINING FACILITIES

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Mar.	12	--	--	--	--
	Apr.	--	--	--	--	--
	May	37	6	--	--	11
	June	--	--	--	--	--
	July	--	--	--	--	--
	Aug.	--	--	--	--	--
	Sept.	--	--	--	--	--
	Oct.	25	19	--	--	7
	Nov.	--	--	--	--	--
	Dec.	--	--	--	--	--
1945	Jan.	6	4	--	--	1
	Feb.	48	53	--	24	19
	Mar.	24	23	1	131	--
	Apr.	6	--	--	--	9
	May	--	--	--	--	--
	June	1	--	9	80	--
	July	--	--	--	--	--
	Aug.	1	--	--	8	--
TOTALS		160	105	10	243	47

# TARGET TYPE VI

LAND TARGETS, known and unknown; urban areas.

PERIOD		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
Year	Month					
1942	Sept.	2	--	--	--	--
	Oct.	--	--	--	--	--
	Nov.	5	--	--	--	--
	Dec.	4	--	--	--	--
1943	Jan.	--	--	--	--	--
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	8	--	--	--	--
	Aug.	41	--	--	--	33
	Sept.	--	--	--	--	--
	Oct.	--	--	--	--	--
	Nov.	12	4	--	--	--
	Dec.	--	--	--	--	--
1944	Jan.	4	--	--	--	--
	Feb.	6	1	--	--	4
	Mar.	10	--	--	--	--

TARGET TYPE VI - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (100s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Apr.	6	--	--	--	6
	May	4	--	--	--	--
	June	--	--	--	--	--
	July	355	137	--	--	103
	Aug.	4	--	--	--	--
	Sept.	--	--	--	--	--
	Oct.	608	160	--	--	252
	Nov.	331	9	--	--	44
	Dec.	50	3	--	--	3
1945	Jan.	191	24	--	--	27
	Feb.	819	125	--	--	274
	Mar.	171	13	--	128	23
	Apr.	199	31	--	40	80
	May	175	3	--	105	52
	June	240	20	--	--	83
	July	138	15	30	24	63
	Aug.	--	--	--	--	--
TOTALS		3,383	545	30	297	1,047

TARGET TYPE VII  
ARMORED COMBATANT SHIPS

PERIOD Year Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1941	Dec.	4	2	--	--	--
1942	June	49	--	--	--	--
	Sept.	5	--	--	--	2
	Oct.	21	--	--	--	6
	Nov.	184	--	--	--	38
	Dec.	13	--	--	--	10
1943	Jan.	--	--	--	--	--
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	10	--	--	--	10
	Aug.	--	--	--	--	--
	Sept.	--	--	--	--	--
	Oct.	--	--	--	--	--
	Nov.	--	--	--	--	--
	Dec.	--	--	--	--	--

TARGET TYPE VII - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M.G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Jan.	1	--	--	--	1
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	--	--	--	--	--
	Aug.	--	--	--	--	--
	Sept,	--	--	--	--	--
	Oct.	--	--	--	--	--
	Nov.	--	--	--	--	--
	Dec.	--	--	--	--	--
1945	Jan.	--	--	--	--	--
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	1	1	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	--	--	--	--	--
	Aug.	--	--	--	--	--
TOTALS		288	3	--	--	67



# TARGET TYPE VIII

## UNARMORED COMBATANT SHIPS

PERIOD Year Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1941	Dec.	23	12	--	--	--
1942	Aug.	11	--	--	--	3
	Sept.	8	--	--	--	1
	Oct.	76	--	--	--	17
	Nov.	37	--	--	--	6
	Dec.	35	--	--	--	4
1943	Jan.	54	--	--	--	11
	Feb.	72	--	--	--	22
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	71	--	--	--	20
	Aug.	8	--	--	--	8
	Sept.	--	--	--	--	--
	Oct.	4	--	--	--	--
	Nov.	--	--	--	--	--
	Dec.	--	--	--	--	--

TARGET TYPE VIII - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Jan.	16	6	--	--	8
	Feb.	19	1	--	8	4
	Mar.	10	--	--	--	6
	Apr.	22	--	--	--	3
	May	1	--	--	--	--
	June	1	--	--	--	--
	July	--	--	--	--	--
	Aug.	--	--	--	--	--
	Sept.	--	--	--	--	--
	Oct.	1	--	--	--	--
	Nov.	14	2	--	--	4
	Dec.	52	10	--	--	9
1945	Jan.	8	1	--	46	--
	Feb.	37	38	--	48	--
	Mar.	64	24	--	296	6
	Apr.	1	--	--	6	--
	May	--	--	--	--	--
	June	2	--	--	14	--
	July	4	--	--	32	--
	Aug.	--	--	--	--	--
TOTALS		651	94	--	450	132

# TARGET TYPE IX

MERCHANT SHIPS and auxiliary craft over 500 tons.

PERIOD		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
Year	Month					
1942	Aug.	6	--	--	--	--
	Sept.	4	--	--	--	2
	Oct.	15	--	--	--	--
	Nov.	82	--	--	--	33
	Dec.	16	--	--	--	3
1943	Jan.	48	--	--	--	24
	Feb.	14	--	--	--	5
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	1	--	--	--	1
	June	--	--	--	--	--
	July	3	--	--	--	--
	Aug.	36	--	--	--	27
	Sept.	--	--	--	--	--
	Oct.	--	--	--	--	--
	Nov.	--	--	--	--	--
	Dec.	20	--	--	--	10
1944	Jan-	111	27	--	--	66
	Feb.	170	7	--	40	40

TARGET TYPE IX - Cont'd

PERIOD Year Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1944	Mar.	79	20	--	--	40
	Apr.	22	--	--	--	3
	May	26	2	--	--	1
	June	33	22	--	--	4
	July	--	--	--	--	--
	Aug.	1	--	--	--	1
	Sept.	30	11	--	--	9
	Oct.	17	9	--	--	5
	Nov.	47	1	--	15	10
	Dec.	83	41	--	47	35
1945	Jan.	46	17	--	124	2
	Feb.	95	45	--	56	26
	Mar.	33	24	--	140	2
	Apr.	17	6	--	90	1
	May	10	6	--	72	1
	June	27	8	11	138	2
	July	21	--	--	166	--
	Aug.	17	--	--	111	--
TOTAL		1,130	246	11	999	353

# TARGET TYPE X

BARGES. luggers, and non-combatant small craft 500 tons or less, and unknown types.

PERIOD Year Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rocket	Bombs (Tons)
1942	Sept.	73	--	--	--	2
	Oct.	1	1	--	--	--
	Nov.	2	--	--	--	1
	Dec.	29	--	--	--	--
1943	Jan.	25	--	--	--	3
	Feb.	--	--	--	--	--
	Mar.	35	--	--	--	35
	Apr.	16	--	--	--	--
	May	46	--	--	--	38
	June	--	--	--	--	--
	July	27	--	--	--	--
	Aug.	32	--	--	--	--
	Sept.	74	--	--	--	--
	Oct.	47	15	--	--	--
	Nov.	81	20	--	--	21
	Dec.	37	2	--	--	8
1944	Jan.	13	--	--	--	1
	Feb.	106	4	--	2	28
	Mar.	220	18	--	--	34



TARGET TYPE X - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rocket	Bombs (Tons)
1944	Apr.	44	1	--	--	22
	May	72	6	--	--	3
	June	57	11	--	--	--
	July	147	13	--	--	10
	Aug.	157	43	--	--	22
	Sept.	140	23	--	--	30
	Oct.	542	96	30	--	74
	Nov.	293	104	--	72	47
	Dec.	365	47	--	10	47
1945	Jan.	271	89	--	--	11
	Feb.	204	73	--	--	3
	Mar.	151	87	--	136	13
	Apr.	95	19	8	44	10
	May	175	23	14	233	26
	June	94	50	86	293	2
	July	130	66	106	94	6
	Aug.	25	20	2	99	--
TOTALS		3,836	831	246	983	497
GRAND TOTALS		106,399	27,080	4,588	35,402	47,552

## SECTION II

### ANALYSIS OF OFFENSIVE OPERATIONS OF MARINE CORPS

#### AIRCRAFT AGAINST ENEMY AVIATION

PERIOD	SORTIES			OWN LOSSES			ENEMY LOSSES		
		A/A	A/C	Total Losses Enemy Action	Opera- tions	Total	Air- borne	On ground	Total
<u>1941</u>									
Dec.	49	--	--	--	2	2	10	--	10
<u>1942</u>									
Feb.	--	--	1	1	--	1	--	--	--
Mar.	4	--	--	--	--	--	--	--	1
June	77	4	21	25	4	29	21	--	21
Aug.	77	1	7	8	--	8	52	--	52
Sept	302	1	14	15	4	19	77	--	77
Oct.	524	5	21	26	5	31	155	5	160
Nov.	489	6	16	22	7	29	70	--	70
Dec.	331	3	5	8	4	12	19	--	19
<u>1943</u>									
Jan.	394	2	7	9	10	19	54	4	58
Feb.	384	5	7	12	9	21	21	2	23
Mar.	162	--	--	--	2	2	1	--	1
Apr.	319	5	12	17	17	34	46	--	46
May	184	1	4	5	5	10	15	--	15

SECTION II - Cont'd

PERIOD	SORTIES			OWN LOSSES			ENEMY LOSSES		
		A/A	A/C	Total Losses Enemy Action	Opera- tions	Total	Air- borne	On ground	Total
<u>1943</u>									
June	258	9	25	34	24	58	89	--	89
July	1166	4	20	24	12	36	109	3	112
Aug.	1069	9	15	24	14	38	128	21	129
Sept.	1218	11	16	27	12	39	72	9	81
Oct.	1058	8	3	11	11	22	57	23	80
Nov.	1741	6	6	12	4	16	20	--	20
Dec.	2009	5	11	16	8	24	75	--	75
<u>1944</u>									
Jan.	1876	12	24	36	12	48	264	1	265
Feb.	2568	18	13	31	7	38	87	--	87
Mar.	3884	16	--	16	1	17	15	2	17
Apr.	3288	21	1	22	9	31	2	--	2
May	3680	25	--	25	6	31	1	1	2
June	3050	17	--	17	5	22	1	--	1
July	5204	15	--	15	7	22	--	--	--
Aug.	6922	11	--	11	4	15	--	1	1
Sept.	5958	15	--	15	8	23	--	1	1
Oct.	7013	16	--	16	7	23	1	10	11
Nov.	6829	16	--	16	13	29	--	2	2
Dec.	4109	12	3	15	9	24	54	12	66

SECTION II - Cont'd

PERIOD	SORTIES			OWN LOSSES			ENEMY LOSSES		
		A/A	A/C	Total Losses Enemy Action	Opera- tions.	Total	Air- borne	On ground	Total
<u>1945</u>									
Jan.	3734	13	1	14	15	29	14	35	49
Feb.	8789	25	8	33	19	52	35	104	134
Mar.	9048	32	7	39	20	59	45	67	112
Apr.	8729	29	7	36	20	56	221	81	302
May	8003	33	3	36	10	46	208	16	224
June	6923	22	5	27	19	46	118	4	122
July	4967	18	1	19	19	38	21	13	34
Aug.	1034	2	--	2	3	5	5	1	6
TOTALS									
	116,423	453	284	737	367	1,104	2,159	418	2,577

# SECTION III

## OPERATIONS OF MARINE CORPS AIRCRAFT

### ANALYZED BY GEOGRAPHICAL AREAS

PERIOD Year Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>MARSHALL ISLANDS</u>						
1943	Dec.	5	--	--	--	2
1944	Jan.	--	--	--	--	--
	Feb.	--	--	--	--	--
	Mar.	593	105	--	--	213
	Apr.	1,197	392	--	--	409
	May	1,673	840	--	--	516
	June	1,476	487	--	--	357
	July	2,272	768	--	--	712
	Aug.	2,889	164	--	--	1,211
	Sept.	1,676	134	--	--	720
	Oct.	1,487	110	--	--	773
	Nov.	1,255	117	--	--	625
	Dec.	1,037	102	--	--	649
1945	Jan.	498	43	34	--	251
	Feb.	59	28	--	--	15
	Mar -	274	53	--	--	131



SECTION III - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1945	Apr.	200	31	82	89	120
	May	251	59	146	132	146
	June	424	106	717	387	214
	July	352	102	407	556	308
	Aug.	82	24	70	104	62
TOTALS		17,700	3,665	1,456	1,268	7,434
<u>EASTERN CAROLINES</u>						
1944	Mar.	38	29	--	--	--
	Apr.	53	33	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	--	--	--	--	--
	Aug.	--	--	--	--	--
	Sept.	--	--	--	--	--
	Oct.	72	13	--	--	32
	Nov.	132	43	--	--	57
	Dec.	85	7	--	--	35
1945	Jan.	--	--	--	--	--
	Feb.	80	24	--	25	31
	Mar.	84	32	--	--	40
	Apr.	17	5	--	--	8

SECTION III - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
1945	May	--	--	--	--	--
	June	--	--	--	--	--
	July	13	--	--	--	6
	Aug.	15	11	--	--	8
TOTALS		589	197	--	25	217
<u>WESTERN CAROLINES</u>						
1944	Sept.	125	4	--	--	25
	Oct.	1,082	236	30	--	263
	Nov.	1,386	245	--	--	206
	Dec.	735	123	--	--	140
1945	Jan.	1,139	149	--	295	247
	Feb.	1,642	127	--	261	214
	Mar.	1,364	84	--	195	325
	Apr.	741	22	8	--	257
	May	926	21	67	--	336
	June	869	17	44	5	337
	July	916	17	31	47	413
	Aug	173	4	12	48	88
TOTALS		11,098	1,049	192	851	2,851

SECTION III - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>WAKE, MARCUS</u>						
1941	Dec.	27	14	--	--	--
TOTAL		27	14	--	--	--
<u>CELEBES, BORNEO</u>						
1945	April	38	38	--	--	11
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	46	24	--	51	14
	Aug.	--	--	--	--	--
TOTALS		84	62	--	51	25
<u>RYUKYUS</u>						
1945	Jan.	15	4	--	--	3
	Feb.	--	--	--	--	--
	Mar.	594	426	--	2762	48
	Apr.	1048	611	60	4825	377
	May	1542	475	477	7412	778
	June	2363	674	1318	8558	968
	July	826	369	595	2095	193
	Aug.	112	65	29	210	2
TOTALS		6,500	2,624	2,479	25,862	2,369

SECTION III - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannons (100s)	Rockets	Bombs (Tons)
<u>FORMOSA</u>						
1945	Jan.	45	30	--	--	5
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	--	--	--	--	--
	Aug.	15	12	--	99	--
TOTALS		60	42	--	99	5
<u>SOUTH CHINA</u>						
1945	Jan.	7	2	--	--	1
TOTAL		7	2	--	--	1
<u>INDO-CHINA</u>						
1945	Jan.	19	30	--	--	3
TOTAL		19	30	--	--	3
<u>EASTERN JAPAN</u>						
1945	Feb.	182	178	--	72	11
	Mar.	--	--	--	--	--
	Apr.	1	--	--	8	--

SECTION III - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>EASTERN JAPAN</u>						
1945	May	3	--	--	24	--
	June	14	--	9	176	--
	July	24	--	--	184	--
	Aug.	--	--	--	--	--
TOTALS		224	178	9	464	11
<u>CENTRAL JAPAN</u>						
1945	Feb.	56	54	--	140	--
	Mar.	31	46	--	92	--
	Apr.	1	--	--	2	--
	May	1	--	--	8	--
	June	3	--	--	14	--
	July	2	--	--	16	--
	Aug.	11	12	--	56	--
TOTALS		105	112	--	328	--
<u>EAST CENTRAL PACIFIC</u>						
1942	June	49	--	--	--	--
TOTAL		49	--	--	--	--



SECTION III - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>ALASKA, ALEUTIANS</u>						
1943	May	1	--	--	--	--
TOTAL		1	--	--	--	--
<u>MARIANAS</u>						
1944	July	5	2	--	--	--
	Aug.	159	104	--	--	16
	Sept.	285	81	--	--	56
	Oct.	403	20	--	--	15
	Nov.	502	110	--	--	73
	Dec.	354	91	--	8	116
1945	Jan.	27	20	--	24	--
	Feb.	8	7	--	--	--
	Mar.	1	1	--	--	--
	Apr.	--	--	--	--	--
	May	4	5	--	--	--
	June	--	--	--	--	--
	July	40	15	61	148	4
TOTALS		1,788	456	61	180	280
<u>GILBERTS, NAURU</u>						
1944	Nov.	51	9	--	--	18
	Dec.	17	--	--	--	17

SECTION III - Cont'd

PERIOD Year      Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>GILBERTS, NAURU</u>						
1945	Jan.	20	--	--	--	20
	Feb.	--	--	--	--	--
	Mar.	--	--	--	--	--
	Apr.	--	--	--	--	--
	May	--	--	--	--	--
	June	--	--	--	--	--
	July	12	4	--	--	3
	Aug.	--	--	--	--	--
TOTALS		100	13	--	--	58
<u>BONINS</u>						
1944	Nov.	16	--	--	125	--
	Dec.	10	--	--	73	--
1945	Jan.	23	--	--	170	--
	Feb.	182	110	--	812	41
	Mar.	--	--	--	--	--
	Apr.	1	--	--	6	--
	May	10	--	--	80	--
	June	2	--	--	16	--
	July	4	--	--	--	--
	Aug.	--	--	--	--	--
TOTALS		248	110	--	1,282	41

SECTION III - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>PHILIPPINES</u>						
1944	Dec.	609	264	--	--	168
1945	Jan.	1,283	509	5	--	407
	Feb.	5,528	1,634	--	--	2,638
	Mar.	5,601	1,713	--	--	2,590
	Apr.	5,026	1,842	--	378	2,379
	May	3,748	1,289	--	564	2,005
	June	2,211	487	78	142	1,160
	July	1,432	375	--	654	794
	Aug.	259	20	78	--	134
TOTALS		25,697	8,133	161	1,738	12,275
<u>WESTERN JAPAN</u>						
1945	Feb.	2	--	--	--	--
	Mar.	156	115	1	863	5
	Apr.	32	14	--	44	7
	May	100	35	--	264	18
	June	132	86	19	77	18
	July	354	115	137	686	68
	Aug.	140	90	13	699	--
TOTALS		916	455	170	2,633	116

SECTION III - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>KOREA, MANCHURIA, AND NORTH CHINA</u>						
1945	July	1	--	--	8	--
TOTAL		1	--	--	8	--
<u>CENTRAL CHINA</u>						
1945	Aug.	8	1	--	49	--
TOTAL		8	1	--	49	--
<u>SOLOMONS AND BISMARCKS</u>						
1942      1943	Aug.	17	--	--	--	3
	Sept.	136	1	--	--	11
	Oct.	179	2	--	--	36
	Nov.	335	--	--	--	78
	Dec.	303	--	--	--	37
	Jan.	315	--	--	--	51
	Feb.	335	--	--	--	62
	Mar.	132	--	--	--	75
	Apr.	147	--	--	--	58
	May	107	--	--	--	47
	June	95	--	--	--	48
	July	780	--	--	--	385

SECTION III - Cont'd

PERIOD Year Month		Marine Aircraft Engaged	M. G. Amm (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>SOLOMONS AND BISMARCKS</u>						
1943	Aug.	716	24	--	--	334
	Sept.	859	77	--	--	460
	Oct.	795	225	--	--	435
	Nov.	1,471	479	--	--	875
1944	Dec.	1,650	432	--	--	983
	Jan.	814	210	--	--	427
	Feb.	1,296	134	--	154	707
	Mar.	2,796	161	--	94	1,553
	Apr.	1,850	194	--	28	1,026
	May	1,632	360	--	48	764
	June	1,427	246	--	--	510
	July	2,698	766	--	--	1,134
	Aug.	3,548	824	--	--	1,383
	Sept.	3,628	1,476	--	--	1,378
	Oct.	3,989	1,856	60	--	1,565
	Nov.	3,543	1,410	--	158	1,385
	Dec.	1,109	204	--	48	815
1945	Jan.	457	100	--	--	549
	Feb.	803	399	--	--	813



SECTION III - Cont'd

PERIOD Year    Month		Marine Aircraft Engaged	M. G. Amm. (1000s)	Cannon (100s)	Rockets	Bombs (Tons)
<u>SOLOMONS AND BISMARCKS</u>						
1945	Mar.	643	64	--	--	725
	Apr.	764	212	--	--	884
	May	799	67	--	--	1,046
	June	426	--	--	--	457
	July	458	--	--	--	624
	Aug-	126	14	--	34	143
TOTALS		41,178	9,937	60	564	21,866
GRAND TOTALS		106,399	27,080	4,588	35,402	47,552

RD 5220

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